# COAL AGE

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Some time since an interesting discussion was started among COAL AGE readers by a reference in these columns to a disputed question on the correct method of sealing off a mine fire.

The echoes of that discussion are still heard and give such strong evidence of its practical value to mining men that we are prompted to suggest another question of mining practice concerning which opinions vary.

A while ago an editorial reference in COAL AGE (Jan. 13) instanced a mine superintendent who "erected an exhaust fan at the upcast to assist the blowing fan at the top of the downcast shaft" and later ordered it removed when he found that "the fan last erected would not draw in connection with the fan already forcing the air through the mine."

This statement gave rise to an animated discussion between two mine superintendents in Illinois, one of whom was using the well known "booster" fan, which he claimed, very properly, was performing the work for which it was designed.

The other questioned the efficacy of the "booster" and produced in support of his argument the editorial in COAL AGE, to which we have already referred.

The first man naturally tossed the argument to the winds and declared with much emphasis that he did not care what anyone said to the contrary; "With the 'booster' running, the men could work; but without it, not a man could stay at his place long enough to complete his day's work."

Here were *facts* against *theory*; and, as usual in such cases, the theory was misunderstood and misapplied. Both men were right and both were wrong. Why? Because they each failed to understand and properly apply a plain statement.

The question we submit for discussion by our readers is the following: Is it possible to run a so-called "booster" fan to assist in ventilating mine workings where the circulation produced by another fan, either blowing or exhausting, is deficient?

Without prejudice to the discussion, which we invite, but in order to concentrate the arguments of all who take part, we would suggest that there are two propositions that should be considered:

1. The conditions in the mine may be such that both fans are working on what are practically two distinct circulations.

2. One of the fans may be run at a speed that is capable of generating a greater velocity in the air than that induced by the other fan.

To state these two conditions more clearly:

(a) Suppose a blower fan is forcing 20,000 cu.ft. of air into a mine; but owing to leaky stoppings, brattices and doors, one or more of the innermost sections of the mine are practically without air. The air in the intake of these sections is "dead." A small "booster" is installed at this point and does the work, drawing the air from the other current and passing it through the inner sections.

Again (b), suppose the second fan is erected at the return end or opening, to work as an exhaust fan on the main current, or tandem to the first. Is this arrangement feasible and will it give results? In other words, can two fans be run tandem, the one forcing and the other exhausting on the same direct current?

*Let us have a full and free discussion of this practical question.*

# The Roslyn, Washington, Coal Field

By Joseph Daniels*

**This is the first of two articles describing one of the most important of the Pacific Coast coal fields. It discusses the geology and the various methods of development in use, including shafts, slopes and rock tunnels; also a number of difficult and novel rope haulage systems. The second instalment dealing with the methods of mining will appear in an early issue.**

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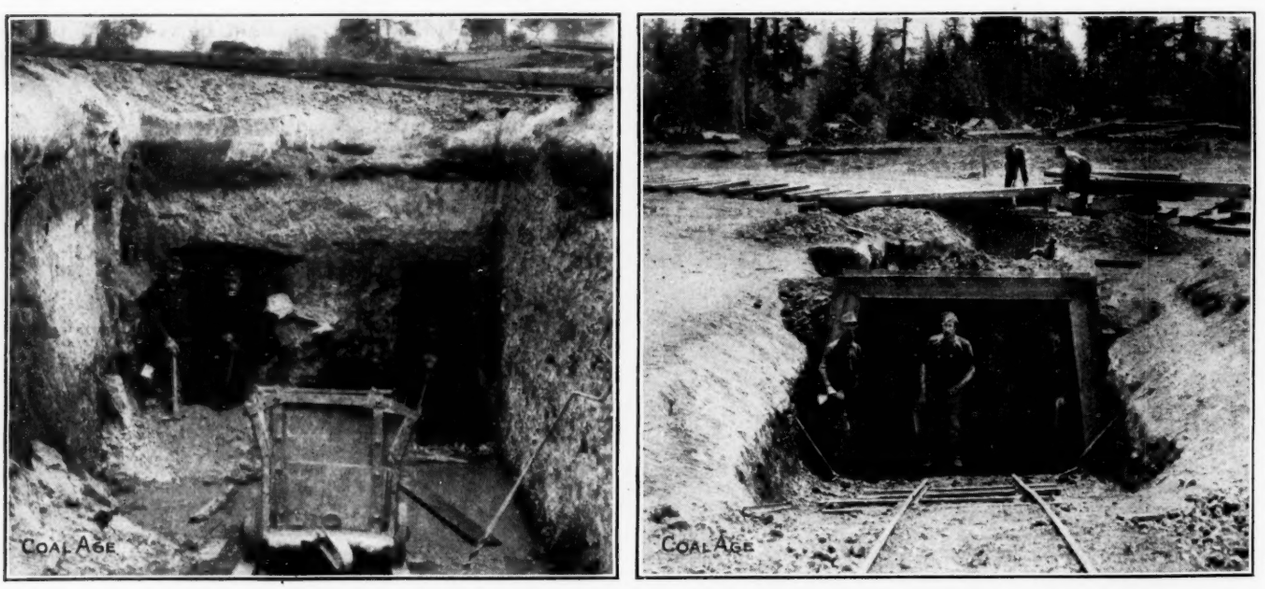
The Roslyn coal field, of Washington, is situated in the west-central part of the state, in Kittitas County, about 100 miles southeast of Seattle. Its area is about 30 square miles and it lies just east of the Cascade Range in the borderland between the range and the Columbia plain. As a coal field it is isolated and seems to form no part of any other coal district of the state.

The Yakima River, just south of the district, is the most important stream in the drainage system. It is joined by the Cle Elum River at a point a few miles west of the town of Cle Elum. The general course of these streams is southeast. The Northern Pacific and the Chicago, Milwaukee & Puget Sound railroads follow the general course of the Yakima River in crossing this part of the state. Cle Elum is the station for the Roslyn field on the main line of both roads. Only the Northern Pacific taps the district now in operation. This it does by the Roslyn branch line, which runs six miles from Cle Elum to Lakedale, near Cle Elum Lake. Roslyn, in the center of the mining district, gives the field its name.




TWO VIEWS OF THE ROSLYN FUEL CO.'S BEEKMAN SLOPE, WHICH WAS DRIVEN OUT FROM THE INSIDE

The field covers the valleys of the Yakima and Cle Elum Rivers, and is bounded by hills on both the north and south sides. The branch railroad, at Cle Elum, has an elevation of 1911 ft., at Roslyn 2222 ft., and continues to rise until it attains an elevation of about 2500 ft., which is at the end of the line. The hills on the north side, back of Cle Elum, have a maximum elevation of about 3300 ft., and those back of Roslyn, 3800 ft. They are composed of the sandstone of the Roslyn formation and rise gradually from the general level of the valley. Ravines along these hills expose the coal along irregular lines of outcrop. On the south side of the main valley, a ridge of basalt, andesite, and metamorphis schist rises abruptly in a pronounced range of hills 2500 ft. above the general level. A number of gravel terraces which occur between the flanks of the hills on both sides of the river cover the coal so that no outcrops are found in the southern part of the field.

## GEOLOGY

The rocks of the Roslyn field are made up of sedimentary measures, deposited in a lake or lagoon during the Eocene epoch of the Tertiary period, and of igneous flows which separated periods of gentle uplift occurring between the successive stages of the sedimentation of the Eocene in this area.[1] [2] The sedimentary measures consist of sandstones, shales, and coal beds, having an estimated total thickness in the Roslyn formation of 3500 ft. The Roslyn formation is partly concealed by the Yakima basalt of Miocene age, under which it dips, and it overlies the Teanaway basalt, which also is of the Eocene epoch. The upper portion of the Roslyn only is of economic importance as it alone contains the known and workable coal seams.

The greater part of the Roslyn formation is made up of massive yellow sandstone. The shale beds vary from fine grained to sandy and no subdivision of the beds has been attempted. Several seams of coal have been found, but at the present time only one, the Roslyn, is of great importance. A new mine has recently been opened on an overlying bed, the so called "Big Dirty," and prospecting is being carried on in the underlying seams. Sufficient information is not yet available to correlate these openings.[3] [4]

The strata of the Roslyn formation in this field lie in the general form of a syncline, the axis of which has a pitch to the southeast. The present workings are all on the northeast side of the field; the measures here have a southwest dip which varies from 10 to 30 deg., but which flattens out as the basin of the synclinal is approached. At the east end of the field the workings end abruptly without indicating any structural change; at the west end, as the workings approach the point where the pitching synclinal axis intersects the surface, the

[1] Mount Stuart Folio, No. 106. Geol. Atlas, U. S. Geological Survey, 1904.
[2] Snoqualmie Folio, No. 139, Geol. Atlas, U. S., U. S. Geological Survey, 1906.
[3] Washington Geological Survey, Annual Report 1901, Vol. I, 1902.
[4] Washington Geological Survey, Annual Report 1902, Vol. II, 1903.

levels swing around at an angle of over 90 deg. This seems to indicate that the Roslyn bed has an extreme length of about 7½ miles in a northwest and southeast direction.

### The Coal

The most important seam, the Roslyn, is a hard and compact bituminous steam coal. The thickness varies with the locality from 4 ft. to 4 ft. 9 in., with a general average of 4 ft. 3 in. The coal thins down to 2 ft. or less in the "troubled" or "faulted" areas, while in other places it will increase to twice or three times the normal thickness, but the average may be taken at 4 ft. 3 inches.

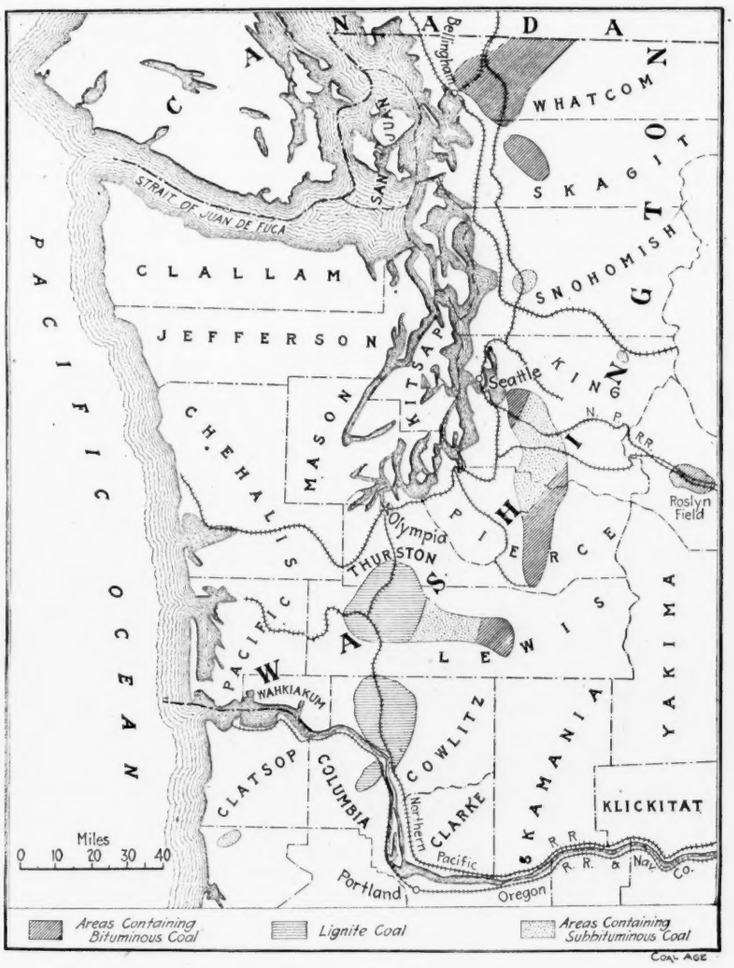
The following may be taken as an average section of the coal:

Roof, sandstone.
Cap rock, shale (variable thickness).

| | Inches |
|---|---|
| Coal | 29 |
| Shale | 1 |
| Coal | 4 |
| Shale | ½ |
| Coal | 20 |
| Total | 4 ft. 6½ in. |

Bottom, firm, sandy shale.

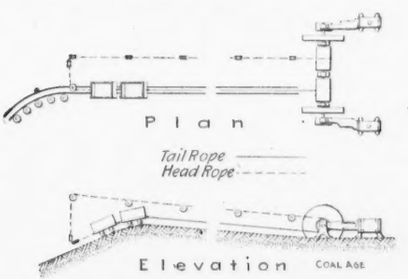
The coal changes in character from one part of the field to the other. At the southeastern, or Cle Elum end, the coal is banded and laminated, resembling bony; at the northwestern end it is denser and breaks with a cubical fracture. The ash in the coal from Cle Elum is greater, the heating value lower and the coking quality less marked than in the coal from the other end of the field. Some of these differences may be explained by the change in the structure of the coal basin as it approaches the western uptilt of the synclinal axis. This change was caused by the increased dynamic action which occurred toward the hills of the Cascade Range.




Map Showing Coal Fields of Western Washington

Moisture in this coal is low. The ash is higher than it would be if the thin shale, clay bands and partings were removed either in mining or in subsequent preparation. The amount of sulphur is small. The accompanying representative analyses taken from a series of 60 samples obtained at Cle Elum, Roslyn, and Beekman, the western end of the field, will give a good idea of the composition.[5]

The domestic market for Roslyn coal is mainly in the eastern part of the state of Washington. Transportation rates over the steep grades of the Cascades to the Puget Sound markets are high, and furthermore, the coal is in competition with the mines of the western part of the state. At the present time, the greater part of the output, about 85 per cent., is used for steaming purposes by the railroads. The marketed coal is used in gas making and for domestic purposes; none is used directly for coke making.




Haulage System at the Dip Mine

### Production Statistics

The greater part of the coal lands represented by the Roslyn field are owned and operated by the Northwestern Improvement Co., a corporation affiliated with the Northern Pacific R.R. Part of these lands include the original grant of each odd section for 20 miles on each side of the right-of-way of the road; the rest have been secured by purchase. Three or four independent companies operate small mines. The field was first opened up in 1886 and in December of that year, coal was dumped over the tipple of No. 2 mine. Production, therefore, may be said to have begun in 1887, and during

[5] "Coals of the State of Washington," Bulletin 474, U. S. Geological Survey, 1911.

CHARACTERISTIC PROXIMATE AND ULTIMATE ANALYSES OF THE ROSLYN COALS

| Mine | Air Drying Loss | Form of Analyses | Proximate: Moisture | Proximate: Volatile Matter | Proximate: Fixed Carb'n | Proximate: Ash | Proximate: Sulphur | Ultimate: H | Ultimate: C | Ultimate: N | Ultimate: O | B.t.u. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cle Elum No. 1.... | 3.4 | As received** | 7.9 | 34.6 | 44.8 | 12.68 | 0.43 | 5.76 | 62.84 | 1.31 | 16.98 | 11,410 |
| | | Air dried* | 4.7 | 35.8 | 46.4 | 13.13 | 0.44 | 5.57 | 65.05 | 1.36 | 14.45 | 11,820 |
| Roslyn No. 4..... | 1.8 | As received | 3.7 | 34.3 | 48.6 | 13.40 | 0.36 | 5.43 | 67.57 | 1.28 | 11.96 | 12,250 |
| | | Air dried | 1.9 | 35.0 | 49.5 | 13.65 | 0.37 | 5.33 | 68.81 | 1.30 | 10.54 | 12,480 |
| Beekman..... | 1.8 | As received | 3.3 | 34.1 | 50.5 | 12.15 | 0.35 | 5.61 | 70.67 | 1.65 | 9.57 | 12,910 |
| | | Air dried | 1.5 | 34.7 | 51.4 | 12.37 | 0.36 | 5.51 | 71.97 | 1.68 | 8.11 | 13,150 |

*Analyses made on air-dried sample. **Calculated from air-dried sample.

the three years, 1887 to 1889 inclusive, 230,548 short tons were produced in Kittitas County. In 1891 the production amounted to 331,444 tons; in 1900, 867,204, and in 1910, 1,667,453 tons were produced, which is the banner production for the county.[6] The production for the calendar year of 1911 was 1,254,845 tons, a slight decrease over 1910.

The entire production of the state of Washington in the years 1860-1910, according to the figures of the U. S. Geological Survey,[7] was 53,647,802 short tons. In the period 1887-1910, the production was 51,084,344 short tons. In the latter span of years, the Roslyn field furnished 18,229,610 tons of this output—very nearly 30 per cent. of the whole.

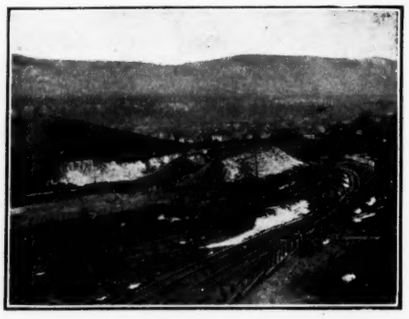
An estimate, recently made by the State of Washington Geological Survey places the original coal content of the Roslyn bed at 71,877,840 tons, covering an area of 9661 acres. Of this content, 65,353,600 tons are estimated as "known workable" and 16,524,240 as "probable" coal. The percentage of recovery in the old workings was taken as 70 per cent. and, from calculations made on this basis, it is believed that the future recoverable coal in the Roslyn bed is 34,054,691 tons.

### Different Methods of Working

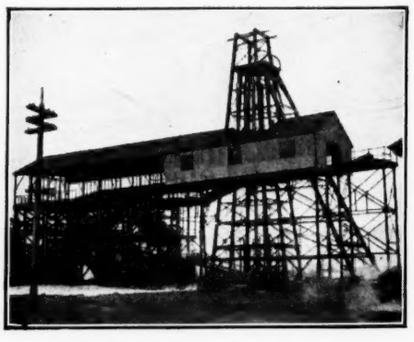
The surface topography of the Roslyn field and the position of the coal with relation to the main surface features have been responsible for considerable variation in the methods of opening and working. The outcrop of the Roslyn bed is found on the north side of the valley, along the hills, at an elevation varying from 2000 ft. at Cle Elum to a maximum of 3700 ft. back of Roslyn. From that point it follows the irregular line of the general topography which roughly resembles a bow and reaches the Beekman mine where the elevation of the bed is 2200 ft. The coal is also exposed in the ravines which cut the hills at frequent intervals.

The general slope of the surface corresponds with the angle of dip of the coal, so that the seams dip to the southwest and yet have a fairly uniform cover of from 100 to 200 ft., up to the point represented by the toe of the hills, where the depth of cover begins to increase rapidly and finally reaches a maximum of about 1000 ft. in the synclinal basin. Since no outcrops occur on the south flank, the only data in regard to the seams must be obtained from bore-holes. The coal can be opened by drifts from the ravines, by slopes from the outcrops, by rock tunnels to the coal at points below the outcrop, and by vertical shafts and slopes. All of these methods are in use.

Two shafts, the Cle Elum No. 1, 250 ft. deep, at one end of the field, and the Roslyn No. 4, 625 ft. deep, near the center of the field, have been sunk to the coal, each reaching the seam at approximately the same elevation. From the shaft bottoms, slopes have been driven in the coal. Numerous air shafts have been sunk throughout the field but in no case are they used for other than ventilating purposes. Of the true slope mines, that is, slopes which hoist coal to the outcrop, only two in the whole field, Beekman No. 1 on the Roslyn Bed



View of the Cle Elum Mines



The No. 4 Shaft, at Roslyn

and Beekman No. 2 on the Big Dirty, will be noted. Slope mines which are tapped by rock tunnels are more frequent. Among these are Roslyn Nos. 3, 5 and 7, and the Patrick-McKay Nos. 1 and 2. In a number of these, the slopes have been extended to the outcrop. The drift mines are mainly the "hill workings" along the ravines. Cle Elum No. 2, No. 3 Extension, Roslyn No. 6, No. 2 East Side, and some small operations represent this type. The other mines, Cle Elum No. 2, Roslyn No. 1 and No. 2 Dip, are worked by slopes connected with drift openings.

### Haulage System

The whole problem of surface and underground transportation is so intimately connected with the topography and method of opening the beds that it should be considered at this point, previous to the discussion of the methods of working. From the main openings to the seam, levels are driven in the coal at intervals of 350 to 400 ft. and usually on an ascending grade of 1 per cent. in favor of the loads. In the case of drift openings, the same method is followed. Landings or gathering stations are provided at the entrance of each level, and trips are made up or distributed from this point either by mule or electric power. General Electric, Westinghouse and Jeffrey motors operating on 500 volts, direct current, are usually employed.

In the slope and shaft mines, rope haulage, operated by steam or electricity, is the general method of handling the trips. In the slope mines, opened by a tunnel to the coal, the hoisting engine is located in some cases at the top of the slope above the tunnel on the surface, and drops the cars directly to the rock tunnel where they are picked up by an electric locomotive and taken to the tipple. In another arrangement, the hoisting engine is below the intersection of tunnel and slope and the rope is taken from the drum to a bull wheel inside the mine and from there down the slope. In this case, the trip is dropped right down to the tipple by the drum. The bull wheel may be so placed that this arrangement will permit full cars to be taken up the slope or dropped down from the "hill" or rise workings above the tunnel.

At the Dip Mine the trip is taken into a drift, as a rope entry, on a rising grade, then dropped down the slope. The empty trip is taken in on a head rope passing over sheaves and a bull wheel to the knuckle, and carries a tail rope connected with the second drum of the hoisting engine. At the knuckle, the head rope is disconnected, and the trip dropped down the slope by the tail rope. The accompanying sketch illustrates the method.

Another arrangement was used at the Roslyn shaft. The rope was carried from the surface down a 10-in. borehole, 500 ft. deep, and the trips pulled up the haulage slope to a point above the shaft bottom and then dropped back to the shaft and hoisted on double-decked cages. Finally, the simplest method of all includes engine haulage on the main slope to the outcrop, and the dropping the cars from the knuckle down to the tipple. In the drift mines the full cars are dropped to the tipple below and the empties raised by gravity or engine planes. Some of these planes are considerably over a mile in length. In every case, the tipple is below the mine opening.

The usual weight of rail on the levels is 16 lb., and on the slopes, 30 to 40 lb. The gage of track is 30 or 36 in., and the weight and capacity of mine cars vary. An average weight of an empty car is 1500 lb. and its capacity 2500 lb.; from 10 to 16 cars make up a trip.

[6] For a detailed statement of production during the 1911 fiscal year see Coal Age, Vol. 1, page 415.

[7] "Production of Coal in 1910." Advance chapter Mineral Resources of United States.

# The New Buck Mountain Colliery

By E. L. Cole

**Following the article in Coal Age of May 18, which dealt with the Buck Mountain breaker, details of the belt-loading and car-handling systems are here considered. The boiler, engine, and miscellaneous equipment of the colliery described.**

In the article describing the Lehigh Valley Coal Co.'s new Buck Mountain breaker, which appeared in the preceding issue of COAL AGE, it was stated that the methods of loading and handling transportation cars were features of particular novelty and interest. As previously explained, coal of all sizes is carried from the storage pockets and loaded into cars by means of a belt conveyor, with adjustable boom end. This conveyor installation consists of a 36-in. Webster rubber belt, running on Robins troughing and return idlers. It is driven at a speed of 200 ft. per min. by a Lycoming high-speed engine, through belt and gear transmission.

### ONE MAN DOES THE LOADING

A layout of the loading arrangement is shown in the sketch, Fig. 1, the entire operation being controlled by one man. The belt is started or stopped by means of a hand lever and a friction clutch on the engine drive. A steam cylinder and piston raises and lowers the boom end of the conveyor as desired. This mechanism is controlled by a four-way valve, conveniently located in front of the operator. A similar steam cylinder with controlling valve opens and closes the pocket gates, by means of seven distinct sets of connecting levers and shafts, which run to the different storage bins and are thrown in and out of connection with the operating mechanism by means of jaw clutches and suitable hand levers. The gates of any particular set of pockets may be operated by simply throwing into mesh the corresponding clutch and admitting steam to the cylinder.

Coal is discharged from the end of the belt into an adjustable chute, which leads it to the cars. Removable screen plates are provided in the bottom of this chute, in order to remove any fine coal which may have resulted from breakage in the pockets. This fine material, together with a certain amount of dirt, which adheres to the belt and tends to travel back with it on the return run, is collected in a hopper beneath the loading head and carried away by a small scraper line, which returns it to the breaker.

### AUTOMATIC BELT-LOADING DEVICE

An interesting detail of the installation is the use of small counter-balanced lips on the ends of the chutes, which carry coal to the belt. A sectional view of one of these lip chutes is shown in the sketch, Fig. 2. It is automatic in its operation, inasmuch as the weight of the descending coal causes it to drop into the position shown in the figure; but as soon as the flow of coal has ceased, it is drawn up out of the way by the counterweight. These lips are installed to secure an even loading of the belt, a matter which is essential to its satisfactory operation. Since the conveyor is loaded at a number of different points along its length, a stationary construction extending down close to the face of the belt would not be permissible.

### HANDLING CARS BY CABLE HAULAGE

Handling cars to and from the breaker by other means than gravity is a decided innovation in the anthracite field. At Buck Mountain, as stated in a previous article, a continuous cable haulage is employed. The endless rope of this system runs up and down between the tracks of both empty and loaded yards, being so arranged with respect to any particular line of track that the rope travels up one side and down on the other. The rope is carried on gum-wood rollers, and guided, where necessary, by cast-iron side sheaves, complete changes of direction being made around sheaves of large diameter. At the end of its run, the cable passes beneath the tracks and returns on the opposite side. The rope is driven by a Litchfield haulage engine of the type shown in Fig. 5. This is located near the breaker at approximately the center of the system. A heavy counterweight, which operates in a tower just outside of the haulage-engine house, is provided, to insure the necessary tension of the rope.

Cars are attached to the rope by means of a Morgan cable grip and a length of chain, which is hooked by the attendant to some convenient part of the car. The

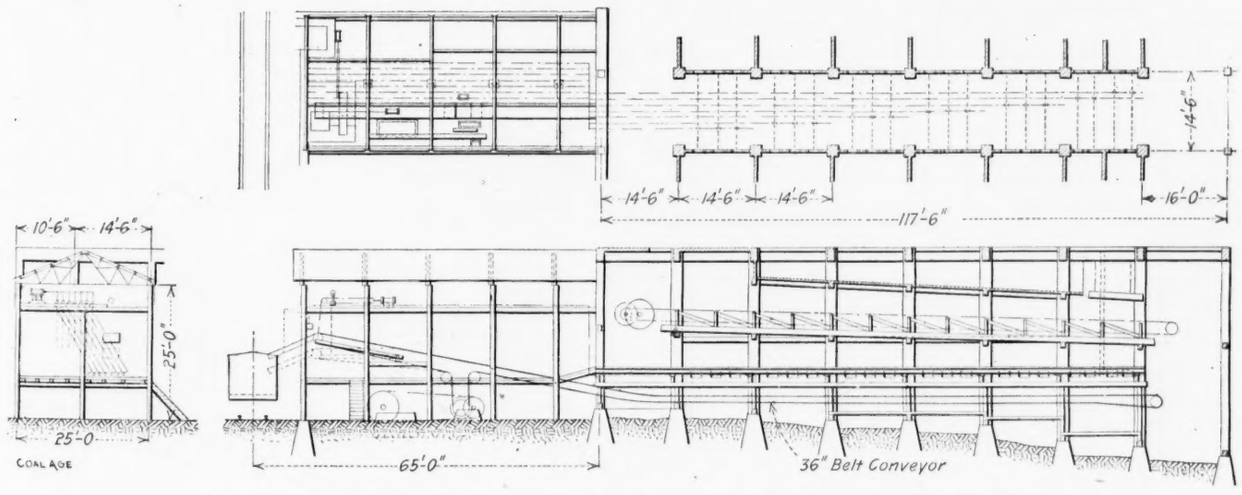



FIG. 1. ARRANGEMENT OF STORAGE POCKETS AND BELT CONVEYOR FOR LOADING CARS

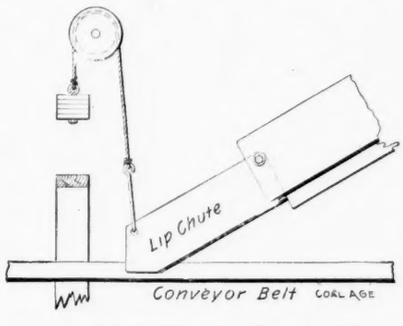



FIG. 2. LIP CHUTE FOR LOADING BELT

grip, as shown in Fig. 6, is controlled by a hand lever, and it will be noted that to release its hold on the rope it is only necessary for the operator to halt, thus throwing the lever back by retaining his hold on it.

### Boiler-plant Equipment

The boiler house at Buck Mountain is located about 100 ft. to the north and west of the breaker. It is a concrete building with steel roof trusses and corrugated iron roofing. One end is closed with a wooden frame and sheathing, to facilitate an extension of the plant when required by future developments. A monitor, extending nearly the full length of the building, is equipped with two lines of pivoted window sash, providing ventilation and some additional light.

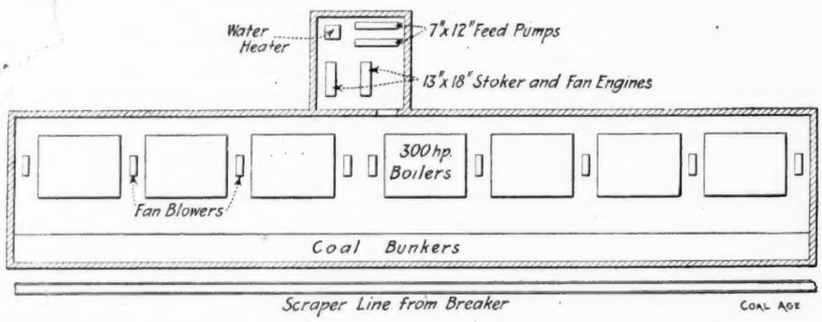



Fig. 3. Sketch Plan Showing Layout of Boiler House

This building houses an installation of seven 300-hp. batteries of Sterling boilers, making a total rated capacity of 21,000 hp. The boilers are equipped with Coxe traveling grates and Sturtevant forced-draft fans. The general plan of the plant is indicated in the sketch, Fig. 5, and a sectional elevation is shown in 3, and a sectional elevation is shown in Fig. 4.

the breaker, by a scraper line, which is driven by an 11x16-in. Atlas engine. This conveyor dsicharges into bunkers within the boiler room, or may be used to accumulate a reserve storage pile just outside of the building. From the overhead bunkers the coal is fed automatically to the Coxe grates. These are driven by belt connection to a line-shaft running the full length of the building, in front of the boilers. Four-cone pulleys are provided for regulating the speed of the grates in accordance with the demand for steam. The whole system is driven by belt connection to a 13x18-in. Atlas engine, located in the pump room, near the center of the building.

### Forced-draft Fans for Each Setting

Forced draft for the boilers is provided by No. 7 Sturtevant fans, which are located in the alleyways between the settings, each fan supplying two boilers. These blowers are supported on steel beams at a height of 8 ft. above the floor level, and are driven by belt connection to a line shaft running the full length of the building behind the boilers. This arrangement provides considerable flexibility in the matter of air supply and leaves the passageways between boilers unobstructed. The fan line shafting is driven by a 13x18 Atlas engine in the pump room, this being a duplicate of the engine which operates the traveling grates.

Steam is taken from the boilers by the usual U-bends, to a header line, which runs overhead above the alleyway at the rear of the settings. The boiler-room steam lines are all of steel pipe with recessed-lap-joint flanges. This plant was installed to supersede the separate equipments located at the old Buck Mountain and Vulcan collieries, as well as to supply the needs of the local surface operations. Both of the above mentioned plants have now been dismantled and steam is supplied to these two operations by 8-in. lines, proceeding east and west from the new installation.

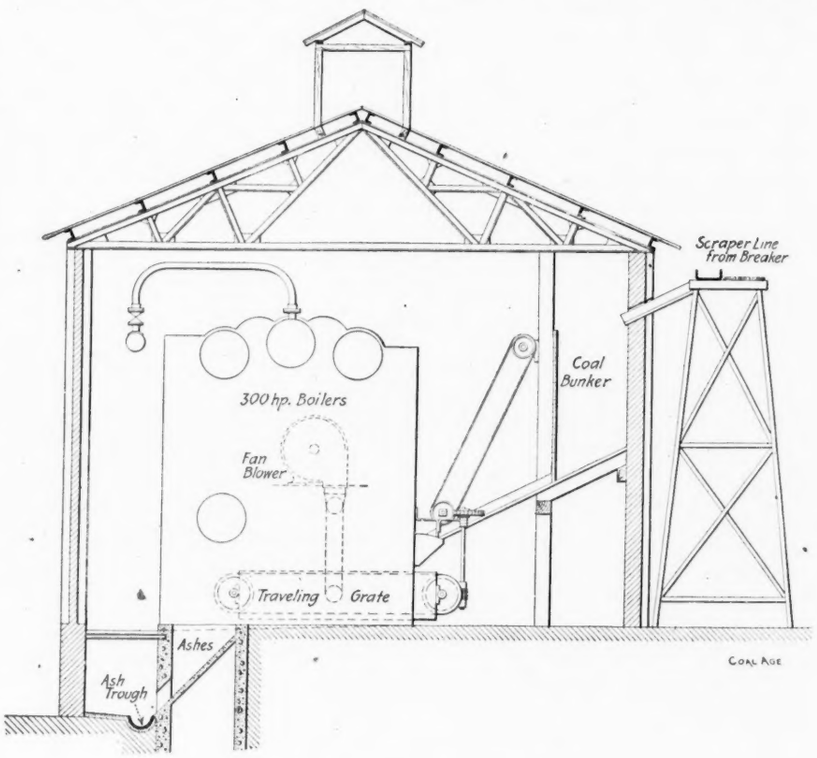



Fig. 4. Sectional Elevation of Boiler House

### Ashes Removed by Flushing

The Coxe grates discharge into concrete ash pits, formed below the floor level at the rear of the boiler foundations. From these hoppers the ashes run to a line of half-round terracotta trough in the ashway at the rear of the building, and are washed out by water from the screens and jigs in the breaker. This water first enters a storage tank at the west end of the boiler house and is drawn from there as required.

Feed water is obtained from three wells, 750 ft. deep, one being of 3-in. and two of 4-in. diameter bore. These have a capacity of approximately 500 gal. per min. The water is forced by compressed air into a group of Caldwell tanks at the top of the bore holes, and flows thence by gravity to two 25,000 gal. steel storage tanks located near the breaker. The boilers are supplied by means of two 7x12 in. Scranton feed pumps, which draw their supply through a Cochrane feed-water heater. This latter raises the temperature of the feed water up to 210 deg. F. and is supplied with exhaust steam from the adjacent breaker engines and boiler house auxiliaries.

The plant is operated by three shifts of four men each, and one foreman, who is on duty during the day and acts in the capacity of machinist and repairman.

### A Model Engine House

The breaker engine house is located directly to the rear of the breaker and is separated from that structure by a space

of 37 ft. It is a building 70 ft. long, 40 ft. wide and 18 ft. high, of concrete construction, with steel roof trusses and purins and corrugated iron roofing. The metal roofing is lined on the under side with asbestos sheeting, held in place by wire netting. This is done to prevent the sweating action of an unprotected metal roof. The building, as a whole, represents a radical departure and great improvement in the design of engine houses in this field. There is provided throughout not only ample working space but an abundance of light and adequate ventilation. All piping is carried beneath the floor, in concrete ducts or runways. These are covered in some cases by removable floor slabs of concrete, and in other instances by cast-iron plates, depending on the frequency with which the underlying pipes will probably require attention.

An equipment of four engines is housed in this building. These all operate at 150 lb. steam pressure. An 18 and 26 x 30-in. tandem-compound Vulcan Iron Works Corliss engine, running at 100 r.p.m., drives the greater part of the breaker machinery through a 24-in. belt drive to a line shaft located in the upper and rear part of the structure. This belt, in its passage from the engine house to the breaker, is protected by a housing of corrugated iron on a specially designed steel frame work.

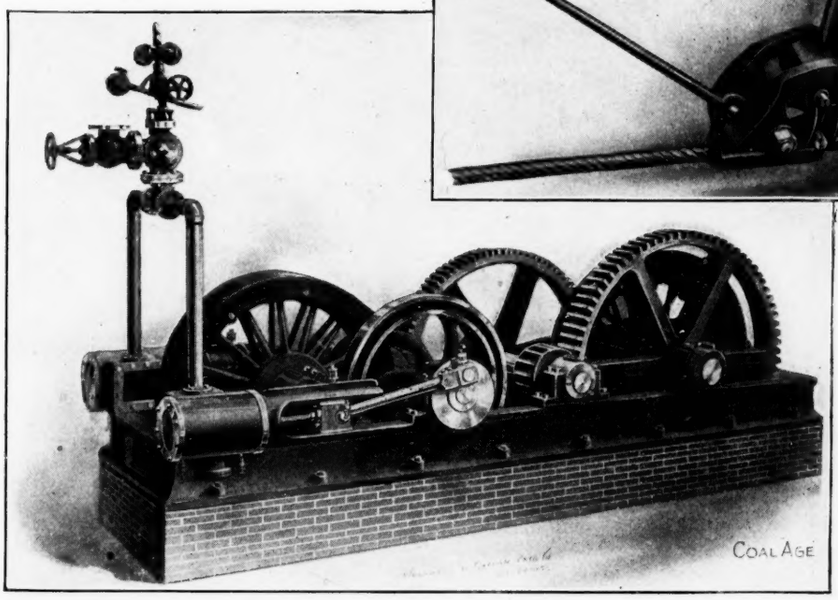



FIG. 5. ENDLESS-ROPE HAULAGE ENGINE FOR CAR-HANDLING SYSTEM

The jigs are driven by a 12 and 16 x 24-in. tandem compound Corliss engine running at 125 r.p.m., and power is transmitted to the jig-line shafts by 1½-in. manila rope drives. A 16x30-in. simple engine drives the Gates crusher and refuse conveyor line, and mine cars are lifted from the ground to the head of the breaker by a pair of 16x30-in. second motion hoisting engines. The self-dumping cages operating in this tower hoist are remarkable for the simplicity and strength of their construction.

### LOCOMOTIVE HOUSE AND CARPENTER SHOP

In addition to the portions of the colliery which have already been considered, the locomotive and compressor house, blacksmith and carpenter shop, and the fan installation are particularly worthy of further note. In the first mentioned building are installed three compressors: one Chicago Pneumatic, one Ingersoll-Rand and one Norwalk Iron Works three-stage machine. The last named furnishes power for two Porter locomotives, which are used for haulage in the mines. The front portion of this same building is fitted up for the accommodation of the two steam locomotives which are used for hauling mine cars on the surface, and the construction of the repair pits for these engines is a feature of particular interest. The tracks are supported on pillars, and the entire space within the limits of the foundation walls is left open, so that mechanics, when working on repairs, are not confined by a narrow pit, and are afforded plenty of daylight to aid them in their work.

The carpenter and blacksmith shop is thoroughly equipped for handling all necessary repair work at the colliery. As to form of construction, it is uniform with the other colliery buildings. The smith shop is located in one corner of the structure, and is separated from the wood-working and machine tools by a substantial partition of tile and cement. A track for mine cars and a repair pit run longitudinally through the building. A drill press, pipe-threading machine, bolt cutter, lathe and circle saw are installed, and all are driven by a 12x16 Atlas engine.

A 20-ft. diameter Guibal-type fan is installed at Buck Mountain, and is driven by a 20x36-in. Vulcan engine. In the fan house also, is located a 12½-kw. Ridgeway 110-volt generator for furnishing light to the colliery operations. This is

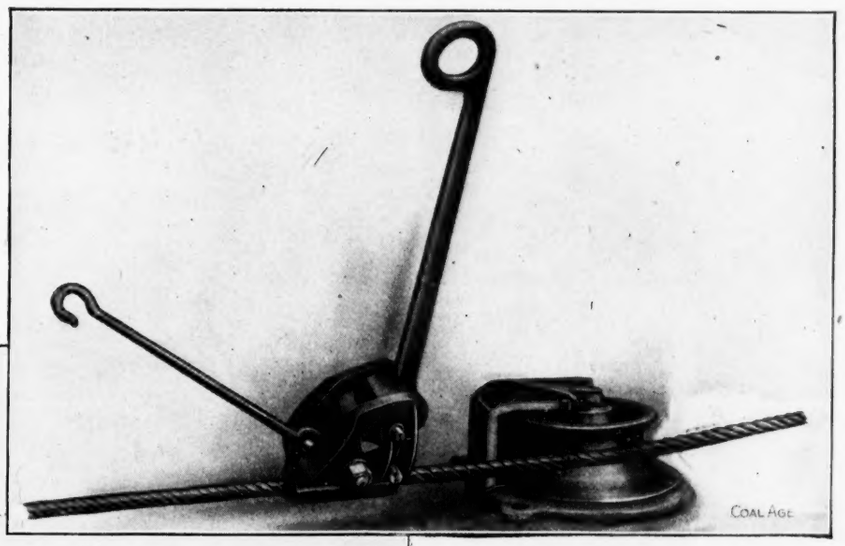



FIG. 6. GRIP FOR ATTACHING CARS TO CABLE

driven at 900 r.p.m. from the fan-engine shaft by means of a Link-Belt chain. The colliery grounds are lighted by 250-volt tungsten lamps, mounted on 30-ft. poles.

### TIME-SAVING ARRANGEMENT OF BUILDINGS

All the various buildings, foreman's and shipper's office, storeroom, oil house, shop, etc., are closely and carefully grouped around the breaker, in order to minimize the loss of time by employees in passing from one to the other of these buildings, and the foreman's office is so situated that he may command a view of practically the entire operation.

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According to E. W. Parker, because of invention of grates and furnaces adapted to the use of small sizes of anthracite coal (and also because of the higher prices of the prepared sizes), the percentage of waste in anthracite coal has been reduced to a minimum. Buckwheat, rice, barley and even culm are now important steam fuels, particularly in hotels, apartment houses and large office buildings in the cities of the East, where smoke ordinances are in force.

# Colliery Boiler Room Practice

By F. R. Wadleigh*

**The average colliery boiler room is usually the most neglected part of the surface equipment, and there are often heavy and unnecessary losses in fuel consumption. Some of the more common mistakes and the resulting losses are noted here, together with remedies for the same, and a number of valuable suggestions on boiler room practice in general.**

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This article refers more especially to the average coal-mine plant. There are many large operations, having central power plants for several mines, equipped with all modern appliances and obtaining results equal to those yielded at any large power plant or station, and a discussion of these will not be attempted.

An experience of some years around coal mines has convinced me that the poorest equipped, worst handled, and least cared for place about the average 200- to 1000-ton capacity mine is the boiler plant. This seems rather strange when it is remembered that the entire working of the mine is absolutely dependent upon the work done by the boilers; yet the reasons for the neglect of economical methods of using coal are not far to seek—lack of knowledge, lack of incentive and the cheapness of fuel. At no other class of power plants will there be found such abuse of coal, such poor firing and such badly kept up plants.

### The General Lack of Knowledge

Efforts on the part of the management to use uptodate and economical methods and appliances are rare. Daily, weekly, or monthly inspections are almost always concerned with the mine, the tipple, and the labor; possibly the engine room is looked into, but the boiler room seldom if ever, or if visited at all, not enough time is spent in it to get any true idea of the working conditions there. Such being the case, it is not surprising that the average mine superintendent pays so little attention to the condition of his steam plant, or to economical methods of operation, and there is little incentive to study combustion questions and the economical handling of the power plant.

There is a lamentable lack of knowledge among mine superintendents and mine bosses as to the proper methods of firing and the conditions under which coal should be used. It is true that nearly all of the mine-foremen examination papers contain questions on combustion and boilers, but these are more or less perfunctory and may easily be learned for the time being, their practical use and importance not being sufficiently emphasized. As long as sufficient steam is kept up to run the plant and no breakdown occurs, the boiler room is let alone to run itself and as little money as possible is spent on it.

That these methods are conducive of much loss will hardly be disputed. In the boiler room, the load, draft, coal, the condition of the fires and boilers, in fact, almost every item, is of a variable nature and lack of knowledge or stupidity will surely lead to excessive consumption of coal and, at some time, a heavy expenditure for repairs or damages.

The mine superintendent should familiarize himself with the principles of combustion, the results that can be obtained with the coal he is mining and the proper use of everything connected with the boiler plant, together with the conditions which will give the best results in economy of fuel and efficiency of working; he should have the requisite knowledge to formulate and put in force proper instructions for firing, cleaning boilers, and the general operation of the steam plant.

### Some Typical Colliery Boilers

Cheapness of fuel is probably the principal reason why more attention is not paid to the boiler room and its equipment and operation. But, obviously, the simple fact that coal is cheap is no valid excuse for lack of efficiency in the power plant and saving in the amount of coal used means increased output for commercial purposes, lower mining cost, less depreciation and lower cost of repairs. In fact, the actual cost of the coal used should be made lower by burning the lowest grade made or by using the bone or refuse thrown out at the tipple, either of which may be made available by proper instruction and the use of suitable appliances.

As concrete examples of bad conditions actually observed at different mine power plants, the following will be of some interest:

Due to change of ownership an examination was made of the four water-tube boilers at a certain mine and over 200 tubes had to be removed, most of them badly burnt and all of them stopped up more or less. As a result, the coal consumption was cut down, after new flues had been put in, over 25 per cent.

Lack of steam to run the tipple caused an examination of the furnaces and fires and it was found that the fires had not been thoroughly cleaned for a long time, the back half of the grates being entirely cut off by a solid mass of clinkers 6 in. thick. The bridge-wall was covered with ashes and clinkers to within 2 in. of the tubes and all the brick baffles gone.

Fires 20 to 24 in. thick, the fireman slicing the fire about every half hour and putting on 18 to 20 shovelsful of coal at each firing.

On three boilers used, steam gage showed 120 to 125 lb. pressure on two, while on the third the gage showed 200 lb. where it remained until boiler was allowed to cool down and fires were drawn. No one around the plant could remember when the gages had been tested.

Dampers rusted open and could not be closed, gage cocks would not open, boiler fronts showed cracks ¼ in. wide, ashpits full of ashes to within 6 in. of grates. Boiler settings were also badly cracked.

The above are a few instances of conditions actually seen at colliery plants in this country. Instead of such conditions obtaining, and they are not at all unusual, the boiler room should be a show place where visitors could see for themselves what good results can be secured from the coal and how it should be handled. As a means of enabling the mine superintendent to have such conditions in the boiler rooms under his charge, the following notes and suggestions are given.

### Boiler Equipment

Good results can be obtained from any kind of boiler, but the old idea that any kind would do for colliery work is fast disappearing. It is becoming recognized that the best is not too good and that it is economy to have only the best, just as much as at any stationary power plant. Whatever type of boiler may be used, ample heating surface should be provided, so that the inferior product of the mine can be used, if it is thought advisable to do so.

At large mines or where there is a central plant supplying power to a number of mines, it is undoubtedly a good policy to put in automatic stokers, as has been done at a number of large collieries in this country. At the average mine, however, the use of stokers is hardly advisable. There would be no saving in labor and almost as good results may be obtained by the use of shaking grates, close inspection, good firing, and by keeping the boilers, furnace walls, arches and baffles in good condition.

The use of shaking grates is strongly recommended, as with them it may be

possible to burn the refuse or rejected coal from the mines. They will also give better results, if properly handled, with either slack or run-of-mine coal, than will stationary grates, besides making the work of the fireman easier, and giving a better supply and distribution of air to the fires, eliminating much of the trouble of cleaning fires and consequent loss of heat. Whatever kind of grates is in use, attention must be given to the following, neglect of which will nullify the work of the best grates:

*Stationary Grates*—Keep the air spaces open, and have the grates fit properly; be careful, in using the slice-bar, not to damage the grates, and do not allow badly warped bars to remain in the furnace and waste fuel.

*Shaking Grates*—After shaking, always be sure that grates are moved back into level position; otherwise they may be partly burned or broken and will waste fuel. As to frequency of shaking, that will depend on the kind of coal used, but do not allow too long a time to elapse between shakings; otherwise clinkers may accumulate and nullify the good effect of the grates. The object of these is to keep the fire clean of excessive ash and not to allow clinkers to form in large pieces.

### The Fireman

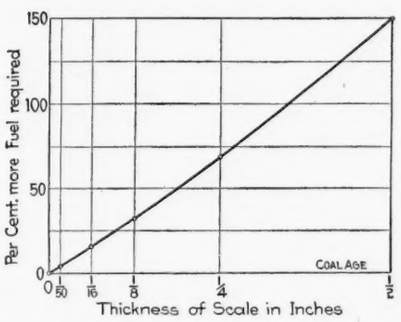
The fireman is the most important part of the boiler plant. It is said by reliable authorities that: "Economy of boiler management is dependent on the skillful handling of the fuel. The fireman can save more to the plant than anyone else," and "To handle a boiler and furnace properly requires expert knowledge and considerable experience and ability. The fireman is, in many respects, the most important man about the plant."

The four main factors affecting fuel consumption are the fuel, air, furnace design and the fireman, and the latter is undoubtedly the most important. Without skill and intelligence on his part no good results may be expected from any grade of fuel or with the best designed boilers and furnaces, as his carelessness or ignorance may nullify such expectations. It should not be a difficult matter for the colliery superintendent to find two or three men of the necessary intelligence and strength whom he can train to take an interest in the work. Especially is this true if he gives some incentive, such as having a decent clean plant to work in and suitable equipment, properly kept up.

Experience has shown that it is much better to use a green man, familiar with the coal and the mine and to train him up properly. Better results will be obtained in this way than by picking up some fireman out of a job whose experience quite often is shown only in his ability to shovel in coal and keep the pump running. Too much stress cannot be laid upon the importance of selecting good firemen, as upon their work depends, in a measure, the whole working of the mine. It will not be necessary to pay more than the prevailing rate of wages if sufficient attention is given to the issuing and carrying out of instructions and to stopping leaks of all kinds and keeping the plant in good repair and equipped with the necessary and right facilities for working.

### The Fuel

The question as to what fuel is the most economical for use at the mines should be given careful consideration, but, as a rule, the coal to be used should be that which is the cheapest, providing it will keep up steam. This can only be determined by actual experiment at the particular plant in question, as a fuel that may be entirely suitable at one mine, will not be the best at another.




Fuel Loss Due to Scale

*Bone* and other impurities thrown out at the tipple often have considerable fuel value, and with sufficient grate surface, and suitable grates, may be used to advantage, provided the cost of conveying it to the boiler room is not prohibitive. Where the impurities consist principally of bone or bony coal, it will usually pay to use the refuse, but where there is a large amount of slate, fire clay or pyrites, its use is not practicable. When it can be arranged, a conveyor line may be run from the picking table, or from a point alongside of the railroad cars, and all refuse, except slate and pyrites balls, thrown into this and taken to the boiler room. Or the refuse may be crushed first and then conveyed to the boiler room. The use of such refuse may often be made possible by putting a steam-jet system under the grates.

*Coke Braise*, which usually amounts to 1½ to 2% of the coke made, can be used very successfully under boilers with forced draft and suitable grates. In England and Germany it is quite largely used at power plants other than those at the mines.

*Slack* is probably the best all-around fuel for use under boilers at mines, either by itself or mixed with the bone or refuse obtained from the tipple. It has been found a good plan to screen out the fine slack and dust at the tipple, say everything that will go through a ½-in. screen and convey this to the boiler room. This method will improve the run-of-mine coal, especially where the coal is soft and friable and the screenings will give good results under the boilers.

*Run-of-mine*, one of the principal merchantable products of the mine, should not be used under the boilers when it is possible to avoid it. If local conditions make it necessary, then such conditions should be changed. There is no sense in using coal that can be sold for $1.10 per ton when coal that brings 75c. can be used equally as well.

The colliery boiler plant is an excellent place to test coal from time to time (as when new seams or new territory is being developed), to ascertain if there is any change in quality of the coal. These need not be elaborate evaporative tests, although such would be better, but merely burning tests, weighing the coal and refuse, and separating the clinkers and ashes to determine whether the coal is clinkering more or less than usual.

### Firing

The following suggestions on the best method of firing will be found helpful and embody the best practice in hand-firing at the ordinary stationary boiler plant:

1. Fire evenly and regularly, putting on approximately the same amount of coal each time and with the same interval between firings.
2. Keep fires in such condition that a moderate amount of coal (two to five shovels full) will be sufficient at each firing, and place the coal where needed, only.
3. Keep the fire clean and bright all over, except when using the coking method, where the fresh charge is banked at the door and the fire kept bright back of the bank.
4. Break up large lumps to the size of a man's fist and have the coal as uniform in size as possible.
5. Regulate the draft and air supply to suit the working conditions.
6. Keep the fire free from holes, especially along the sides and back of the furnace.
7. Watch closely the condition of the fire and the steam pressure as they are dependent on each other. If the pressure varies, some change in the fire caused the variation.
8. Keep the steam pressure even and without variation.
9. Carry water in the boiler at a uniform and regular height.
10. Do not level or stir the fire unless absolutely necessary.

11. Find the thickness of fire necessary to prevent smoke and keep up steam and do not allow this to vary.

12. Keep flues and heating surfaces clean.

13. Do not allow leakage of air into the furnace or combustion chamber.

14. Do not allow ashes or clinkers to accumulate on the walls or in the combustion chamber.

15. Clean fires when necessary, but do not allow them to run too long; deficiency of air through the grates means incomplete combustion, loss of efficiency and increased smoke.

16. If the furnace has more than one door or there is more than one furnace to be handled, fire in alternate doors and it is better to put coal on alternate parts of the fire reached by each door. This is the so called "ribbon" method of firing, the coal being put on in alternate strips across the full length of the grate, as shown in the accompanying sketch, *A*, *B*, *C*, and *D* representing that portion of the grates served by one door and 1, 2 and 3, the firing strips across the grates. Firing should be done across *A*1, *A*3; *B*2; *C*1, *C*3; *D*2; then back *D*1, *D*3; *C*2; *B*1, *B*3; *A*2.

This method gives more even temperatures in the furnace, affords a better chance of mixing the gases from the fresh coal with the incandescent gases and heated air from the bright fire, thus preventing smoke, and giving a more even steam pressure, systematic stoking and less contraction and expansion of the boiler plates and flues.

### Boiler Records and Inspection

To systematize the work in the power plant and to enable the superintendent to keep track daily of what is being done, records should be kept of the day's work, which should include:

Amount of coal used, estimated or weighed.

Average steam pressure. Every plant of any size should be equipped with a recording steam gage.

Amount of ashes and clinkers removed. These should either be weighed or records kept of the number of loads, as this gives a valuable check on the quality of the coal.

Temperature of the feed water. Hourly observations.

Condition of boilers.

Condition of grates.

Date of boiler cleaning.

Time flues were blown.

Condition of boiler pumps.

The fact that records are kept and followed up is of itself an incentive to the engineer, fireman, and master mechanic to improve their work. It has often been found, too, that an investigation into the cause of poor records has led to either the discovery of a leak, need of important repairs or a revision in methods, none of which might have been discovered without the use of such daily records.

In addition to having daily records, the mine superintendent should, as a matter of course, make a daily inspection of the boiler room, not only to satisfy himself as to the condition of the plant and its handling, but also to show the firemen that interest is being taken in their work and its importance recognized.

Every uptodate colliery boiler-plant should have at least the following equipment:

Feed water heaters. Their value is obvious.

Pumps. Boiler pumps should always be in duplicate or injectors furnished.

Feed water regulators. These save their value in fuel economy, safety, pump repairs and the fireman's time.

Damper regulators. These are important fuel savers and regulate the air supply according to the demand for steam.

### Water Supply

The water supply should be closely investigated, as upon this point depends the proper and economical operation of the whole plant. The different sources of supply should be located and a careful comparison of the cost from each source made up. An analysis should then be made of the different waters to determine their value for boiler use, and whether they are corrosive or likely to deposit scale or sediment.

If the latter is liable to occur, steps should be taken to determine how to best neutralize these deposits, and whether it would be advisable to install a water softening plant or resort simply to boiler cleaning compounds. No boiler compound should be used except that specially made for or adapted to the particular impurities in the water under consideration. A compound that will suffice for one kind of water may quite possibly be of no use whatever for another.

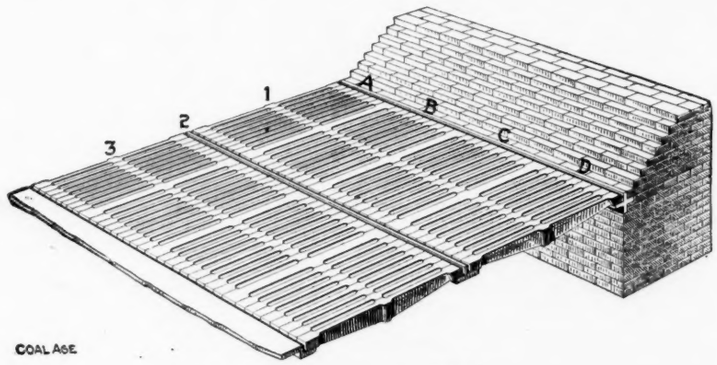
Gage cocks should be kept open and used several times daily. The glass on the water gages should be kept clean and water and steam connections blown out several times daily, especially through the water valve, which is the most liable to become stopped up.

### Scale Accumulations

Whatever type of boiler is used, it is absolutely necessary that they should be kept clean inside and out. This may seem obvious and hardly necessary to repeat, but an examination of many colliery plants will soon prove that it is often badly neglected.

If a fire-tube boiler is used, the flues should be cleaned out with a blower once a day at least and the same applies to the outside of the tubes in a water-tube boiler. The frequency of cleaning the inside of fire-tube boilers and inside the mud-drums and tubes of a water-tube boiler, can only be determined by actual experiment or analysis of the water, but by no possibility should boilers be allowed to run longer than the regular time without cleaning.

The accompanying profile shows the enormous losses of fuel resulting from accumulations of scale in boiler tubes, as shown by actual tests made by the Lagonda Manufacturing Co. on a boiler with 2-in. tubes and working under 90 lb. steam pressure. These losses vary greatly according to the character of the deposit, and the results here given are close to the maximum on record with the worst kind of scale.




Sketch of a Boiler Firebox

### Operation

The following points should be watched to insure good results and minimum losses:

Boiler settings and walls, fronts and cleaning doors, should be kept in order and all cracks and leaks promptly stopped up. Furnace walls should be kept free from clinkers; baffles and bridge walls in good condition and no accumulation of ashes or clinkers allowed.

Leaks should be stopped at once in all piping and steam pipes should be covered to avoid condensation and loss of heat.

Boilers should be blown out once a day, preferably in the morning.

Safety valves should be tried every morning, to see that they work properly.

Steam gages should be tested once every three months, and they should be kept clean, and placed where they can be easily seen.

The advantages of good draft are apparent. No accumulation of ashes or soot should be permitted that would in any way interfere with the draft, and the breeching and stack connection should be kept tight and clean.

All ash pits should be water-tight and water should be kept in them at all times. They should be thoroughly cleaned out whenever the fires are cleaned and oftener, if necessary.

The necessary tools to properly handle the boilers should be provided and these should be hung up on the walls when not in use.

List of tools: Shovel, rake, two-pronged hook, slice bar, coal pick, T-leveler (made of pipe and used only for leveling top of fire) and a long-handled scraper, for raking ashes out of pit.

### General Notes

Coal should be placed in the boiler room within easy reach of fireman, and a hard, level floor should be provided, preferably concrete or vitrified brick. The superintendent should insist on the boiler room being kept clean and no accumulations of scrap, ashes, water, etc., allowed. A water hose and connection to the boiler feed should be provided for wetting ashes and for general cleaning.

The boiler room should be made as light and be as well ventilated as possible, and should have a toilet and wash basin with running water. Experience has proved that these general improvements and facilities pay, as they assist in getting better results and make it easier to get and keep good men.

In the examinations for the position of mine foreman, more attention should be given to power-plant questions and more knowledge required from the candidates since the use and making of power is one of the important questions in mine operation. It is among the mine foremen that we must look largely for our mine superintendents and managers, and the better educated they are on all mining questions, the greater will be their efficiency.

# An Improved Mine Rescue Apparatus

## Special Correspondence

**Oxygen tanks must needs be cumbrous and heavy in order to resist the pressure of their contents. When the oxygen is held in chemical combination, the weight can be considerably reduced. A compound of oxygen and sodium hydrate, which liberates oxygen when water is dropped on it, is used in this apparatus.**

The development of self-contained breathing apparatus for mine rescue work has extended over many years. However, the point has been reached but recently where the apparatus could be considered as of any practical value to the mining industry. This is due largely to the fact that a breathing contrivance to be efficient has practically to parallel the functions of the human organism; whereas the body receives oxygen creating carbon dioxide, the apparatus must deliver oxygen and absorb the $CO_2$.

Side View of Servus Mine Rescue Apparatus, Showing Mask

Four qualifications, therefore, are absolutely essential: (1) The volume of oxygen must be ample to meet every requirement, the actual need of the lungs ranging from 0.2 liter to 2.0 liters per minute according to the amount of labor performed by the operator. (2) The absorption of $CO_2$ must be relatively complete, the volume of this gas thrown off being about equal to the volume of oxygen absorbed, the exact ratio being 9:10. The presence of over 5 per cent. of this gas in the inspired air causes discomfort, and a great percentage utterly unfits the operator for any actual service. (3) The inspired air must be cool and contain the proper amount of moisture necessary to keep the mouth and nasal passages from becoming dry. (4) The apparatus must be light in weight and so suspended on the body as to cause the least discomfort and allow the operator free use of both arms.

### Development of Breathing Apparatus

The early types consisted of a helmet and large flexible bag. In the latter was placed a package of flax or cotton waste saturated with a solution of caustic potash. The bag was then inflated with oxygen, and for a short period, the apparatus was of some slight value. The next step was the addition of oxygen in steel cylinders, which was released into the bag either by means of a regular locked feed, or at the will of the operator. This method was fairly satisfactory, but the renewing of the generator meant inevitable delay at critical times when human life was a matter of moments.

The next advance was the production of a sealed regenerator, the capacity of which would be constant for a given period and through which the air was drawn by an injector. This method has proved fairly efficient, but because of the excessive weight of the apparatus, which is due largely to the oxygen cylinders, and because the whole construction and method of operation are so complicated, it is conceded that this plan still leaves much to be desired. The new device known as the Servus Oxygen Mine Rescue Apparatus, manufactured by the Servus Rescue Equipment Co., of Newark, N. J., has been designed to overcome these objectionable features. In this type

Apparatus As Seen from Rear, Showing Cooler and Breathing Bag

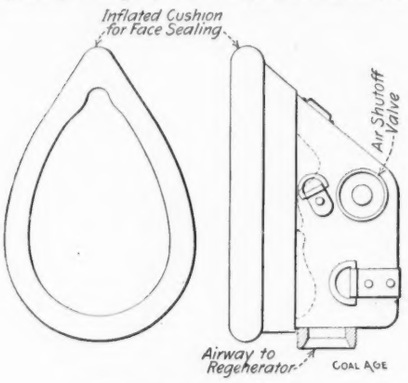
a chemical combination of oxygen with sodium hydrate is utilized, the compound being of such a character that it instantly liberates oxygen gas 100 per cent. pure on the addition of water, exactly as acetylene is released from calcium carbide.

### The Source of Oxygen

This chemical, known as Oxodon, is fused into convenient cakes, five of which are used per hour, liberating 130 liters of oxygen and leaving a residue of one kilogram of sodium hydrate, which is used simultaneously for taking up the $CO_2$, which it accomplishes perfectly. The chemical is placed in a heavy rubber bag and the air passed over it, this bag being also used to receive the air exhaled by the wearer.

Water contained in a cylinder above the bag, is used jointly for generating oxygen and for cooling purposes, principally the latter, the air having to pass over the water when inhaled. A valve controls the starting and stopping of the water drip, but its actual regulation is accomplished by a set adjustment so that the proper flow is assured at all times.

The weight of the one-hour type, completely charged, is but 18½ lb. and of the two-hour type is but 22 lb., the difference in weight resulting principally from the greater amount of water carried for cooling purposes in the latter type.




Side View of Mask

The lightest action of the lungs provides the necessary motive power to insure perfect and complete circulation, which is directly controlled by two check valves of the mica disk type operating in reverse directions. The exhaled air, after leaving the mask, travels through a non-collapsible tube over the left shoulder down through the cooler into the bag, where the $CO_2$ is absorbed and the air is replenished with a supply of oygen. After leaving the chemical, the air is passed through a series of tubes surrounded by water which removes the heat caused by chemical action and condenses the excess moisture. The air then passes through the second tube over the right shoulder into the lungs.

### The Mouth-and-Nose Mask

It is generally conceded that a helmet which entirely encircles the face, is hot, liable to leakage, and depends for safety wholly upon a rubber pad or an inflated air cushion. Moreover, the wearer is restricted in motion and in vision. The mouth piece, while permitting free motion of the head, is insanitary, prohibits conversation, affords no protection to the nose, and necessitates mouth breathing, with the resultant dryness of the throat so familiar to wearers of this type of apparatus.

A mouth-and-nose mask has been long recognized as ideal, but until recently has been considered unavailable because of the inability to secure and seal it properly to the face without undue and uncomfortable pressure. The Servus apparatus is equipped with a mask which encircles the nose, mouth and chin and which is retained in position by a special piano wire spring strap, affording a uniform tension at all times without any discomfort to the wearer.

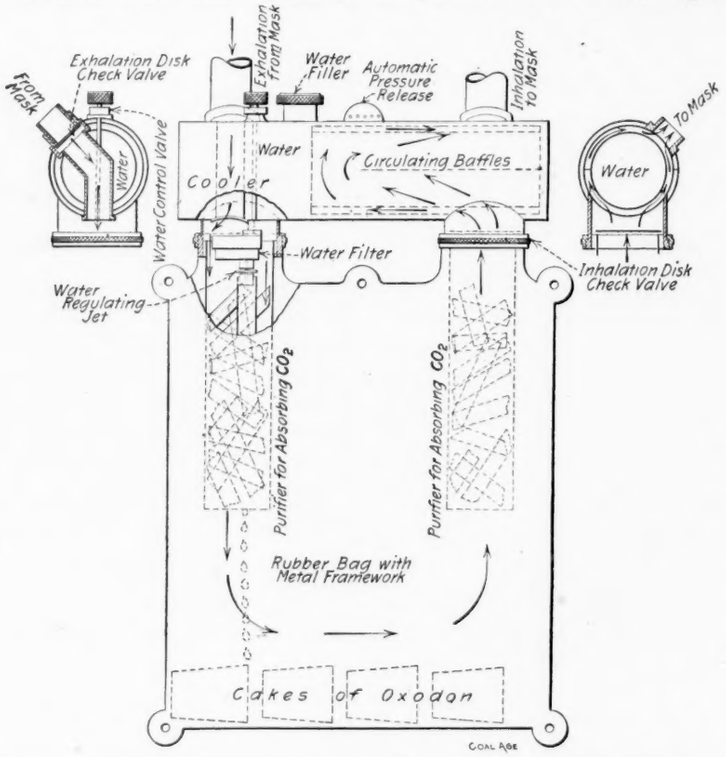



Diagram Showing Mode of Action of Breathing Bag and Cooler

In all other types, face sealing is accomplished by inflating the rubber cushion, and serious difficulty has been encountered from inherent inequalities in the rubber, which permit air bladders to form and burst under pressure, rendering the apparatus instantly unavailable. The wire spring strap provides that a perfect seal can be made between the Servus mask and the face. But to give further assurance, the rubber cushion is inflated by discontinuous pressure on a rubber bulb. A check valve between bulb and cushion provides for the retention of all air thus pumped into the latter. Both air and water are used to make the seal. When no longer in service, the end of the bulb is pressed and the excess pressure in the cushion is released into the bulb. When the mask has been strapped on, ready for use, the bulb is pressed, and the operator forces the air and water into the sealing cushion, the bulb remaining collapsed while the device is in service. This water at the time of manufacture, is made slightly alkaline and thus acts as a preservative to the rubber.

### Availability in Service

The rubber bag, which serves both for a regenerator and as a breathing bag, is covered with asbestos and mohair canvas and protected by a substantial metal frame work, so that the operator, when crawling through narrow spaces, cannot readily force out the reserve air, or puncture the bag. In suspending the Servus apparatus, the knapsack idea has been followed, the weight being high up on the shoulders and the pull being directly downward, leaving the chest entirely free from straps.

No costly supply of regenerators and spare parts is necessary. Oxodon, cold water and sodium hydrate are the only requisites for the immediate operation of the apparatus. Oxodon will keep indefinitely without deterioration when sealed in the special containers in which it is supplied. Its action on rubber is specifically preservative.

The Servus apparatus is made in four types: No. 1 is the two-hour type and is designed for heavy labor such as would be required in mines. Weight 22 lb. No. 2 is the same as No. 1, except that it has less cooling surface and slightly smaller

bags. Weight 17½ lb. No. 3 is intended for one-half hour's work only and is of markedly different design. It is placed entirely in front of the wearer and being without check valves, the air travels through two small tubes into the bag and back through the same tubes. This latter apparatus is designed more for fire-department work or for inspection work in mines. No. 4 is a compact, light, emergency mine rescue apparatus, designed for use in smoke or gas, where the rescuers can penetrate to a body of imprisoned men. Each man can carry from one to ten apparatus, and by their aid can enable the endangered persons to travel to a safe place.

They are also designed for permanent storage at strategic points in the mine, where they may be instantly available in the event of a fire or an explosion. The apparatus just described marks an important step forward toward the perfection of rescue apparatus. The positive action of the oxodon, the light weight of the apparatus, its freedom from cumbersome bulk, its simplicity and comfort to the wearer, are some of its advantages. Because of its simplicity, and the fact that it is manufactured wholly in the United States, its cost is not prohibitive and its delivery is not subject to delays.

## A New Type of Rivetless Chain

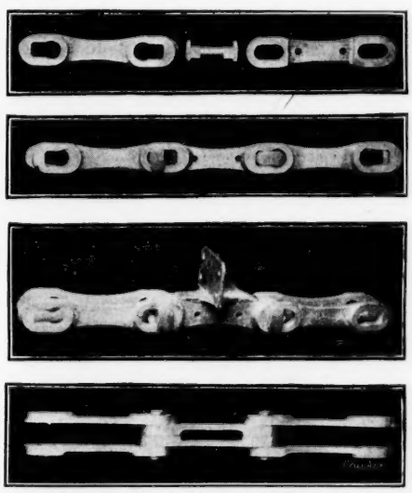
Nearly everyone who has had much to do with elevating and conveying machinery around coal-mining plants, or elsewhere under similar conditions of service, has at one time or another come to the conclusion that no conveying chain on the market was quite right, and has forthwith set out to devise one that would be perfect. The results have been varied, but most frequently disappointing, and of the many forms suggested only a comparativeiv few of proven worth have survived in extensive use.

One demand, however, has always been particularly insistent, and this is for a rivetless chain, one that can be detached and put together without the use of tools and without involving the delays to operation, consequent upon the necessity of cutting out and riveting up a number of pins in case of breakdowns. Several successful chains of this type have been in use for some time, but a new rivetless chain which promises to still further supplant a number of forms of riveted chain, now generally in use, has been patented recently by Joseph L. Lee, general superintendent of the Cross Engineering Co., Carbondale, Penn.

This chain, as shown in the accompanying illustrations, is rugged and simple in construction and is intended primarily for heavy elevating and conveying work. There is but one style of pin and two styles of link—the inside and outside links. The illustrations are almost self-explanatory, but it may be well to quote from the claims made for this new product by its inventor and manufacturers.

The chain is interchangeable in all parts. The parts are easily and quickly detachable, and each section can be detached in less than a minute. The links can be released or removed by a horizontal movement equal to the diameter of the pin, that is, a movement of 1⅛ in. for the 9-in. pitch chain, thus doing away with the necessity of adjusting the take ups when links or pins require renewal.

The chain will operate over either a sprocket wheel or a traction wheel, and is interchangeable with certain other types of rivetless chains. It has a wearing surface on both links and pins which is equivalent to that of the standard riveted eye-bar chain, generally known as the "Scranton" type. The pins of the



NEW RIVETLESS CHAIN AND CHAIN PARTS

new chain are reversible, so that after becoming worn on one side, they can be turned through 180 deg. to present an unworn surface for 100 per cent. additional wear and, at the same time, will tend to restore the chain to its original pitch.

A special feature of this chain which is claimed to be a distinct advantage over any other type, is the lip shown on the outside links. Thus, when the chain is in working position, whether passing over a sprocket or traction wheel, the slotted space in the center links, back of the pin, is entirely closed. This feature prevents dirt or gritty material from coming in contact with the wearing surfaces, and, if desired, the recess or pocket may be filled with any solid lubricant, such as graphite or hard grease.

The chain links, being solid, have a distinct advantage over the web or open type of links as there is no compression at any point on either link or pin to cause the chain to part or the attachments to stick, and it is not necessary to remove the attachments in order to disconnect the links or pins. The two center links form a pocket for the insertion of the several forms of attachments required. On the other hand, these links may be reversed and placed back to back for use with side attachments. The links are to be drop forged from 0.30 to 0.40 per cent. carbon steel and broached to assemble with an accurate pitch, and the pins are to be drop forged also, and machine finished. The whole is to be assembled to length in the shop to insure free working of chain parts.

There is just one infallible test for an elevating and conveying chain and that is service under the conditions for which it was designed; but it may be said of this new comer in the field that it has every appearance of being thoroughly reliable, practical, and serviceable and capable of living up to all that is claimed for it. The Cross Engineering company is preparing to manufacture this chain in 4-, 6- and 9-in. pitches and a number of mechanical men in the anthracite coal region are of the opinion that it will find a broad field of application.

## On Spanish Needles

Publishing houses are often in receipt of strange and weird communications, but we think the ultimate refinement has now been attained in a recent letter to the *Engineering & Mining Journal*, regarding which it says:

It's hard to keep a good fake down. Out of Darkest Arkansas comes an inquiry for a good, reliable "Spanish needle" for locating gold and silver. It's no use spoiling a thing in the telling, so we offer it in the original orthography and typographical style of the Arkansas hinterland:

April 3+4, 12—To the "Engineering and Mining Journal": I Will now Drop you a few lines to see Wheather or not you all handle eny Spanash Needles en your line of Goods iff you Doe Please Send me your Price list on them and your Best Turms and I Want one that a man Can Depend on. I Want one that will loe cate Silver or Gold and iff your house Don't handle the Goods Would you Bee able to Give me the name of some furm that Does. Well I Will Remain as ever yours truly ——— ——— By By hoping to here from Soone and a Good Reply.

We chronicled, in the "Journal" of Feb. 4, 1911, the interference of the postal authorities with the Stauffers' thriving mail-order business in "goldometers," "electrometers," and "Spanish needles." We have not since heard of any new school giving "short courses" in gold finding.

## This Week's Front Cover

The underground flashlight shown on the front cover of our issue this week is a view taken at the face of a room in one of the mines of the Lumaghi Coal Co., Collinsville, Ill. The coal is of medium hardness and is from 7 to 8 ft. in height. The seam is practically flat. The compressed-air pick machine, or puncher, shown in the cut, was manufactured by the Sullivan Machinery Co.

The puncher is engaged in making a wedge-shaped undercut to a depth of about 5½ ft. The cut is 18 in. high in front and tapers to 3 or 4 in. at the back of the mining. This style of undercut causes the coal to roll nicely when it is broken down, and frequently brings better lumps than when the undercut is made with a chain machine.

# The Anthracite Miners' Convention

## Special Correspondence

**Anthracite miners, in convention at Wilkes-Barre, May 18 accepted the tentative agreement reached some time ago by a subcommittee of miners and operators, and have returned to work. Two separate accounts of the convention, from different points of view, are here presented.**

The tri-district convention of anthracite mine workers, in session at Wilkes-Barre, Penn., voted on Saturday, May 18, to accept the tentative agreement entered into by the subcommittee of operators and miners, in New York on Apr. 25, and peace is now insured in the anthracite region during the next four years. The vote stood 323 to 64 in favor of acceptance.

President John P. White, and those who were associated with him in arranging the terms of the tentative agreement, stated emphatically and impressively during the course of deliberations that they had secured the best terms possible, and that strike or no strike, further concessions were not to be obtained from the operators. President White's public revelations of the actual condition of the union and its finances were merely an official affirmation of facts known to the operators, to the miners who took an intelligent interest in the affairs of the union, and to every person in the anthracite region, who had gone to the trouble to investigate the situation.

Opposition to the acceptance of the agreement, emanated chiefly from representatives of the foreign miners in the lower districts of the anthracite field. These men knew as well as the more conservative and conciliatory officials, the exact condition of the union and the impossibility of winning a strike if a strike was declared. Moreover, they knew that if the strike was lost, the union would not survive. Yet for several days they fought ratification of the agreement, without having any rational principle to defend or any definite policy to pursue.

Their notion of an adjustment seemed to be that the coal companies were in a position to accede to any raise in the rate of wages, that they might demand, because the operators had it in their power to raise the price of coal indefinitely. Perhaps one of the most valuable results of the convention is that it has brought home to the foreign mine workers a more just perception of the purposes of a union, and the fact that public opinion counts for something in the adjustment of a disagreement between capital and labor, which affects the common welfare on an extensive scale. The disappointment of these men was great, and their personal distress was apparent when in some way they at last came to realize the logic of the situation and that a strike would have been disastrous for them as well as for the union.

The newspaper reports sent out from Wilkes-Barre, during the convention, failed to give a fair or accurate impression of what was there taking place. Newspapers, published in the anthracite region, were conscientiously anxious to minimize the importance of any exhibition of strike feeling that developed during the proceedings, while the representatives of New York and other outside newspapers, were anxious to accentuate the more sensational episodes, making it appear that a strike was imminent. As a matter of fact, from the beginning to the end of the convention, there was not the slightest danger of the tentative agreement being rejected.

All doubt on this score was set at rest by President White's speech. It was not so much what he said regarding the numerical and financial strength of the union, as his strong and emphatic exposition of the merits of the agreement and the results of rejecting it, that in the end caused it to be accepted. John P. White seems to be an exceptionally able man. He dominated the convention, and in my opinion, while in no sense an idealist, he is a better leader than John Mitchell. There is not about him the slightest suggestion of playing to the gallery.

### Opposition to the Agreement

Andrew Matti, a district vice-president and leader of the Italian miners, conducted the opposition on the ratification of the agreement. Mr. Matti was rather noisy in an oratorical way, during the first few days of the deliberations, speaking often and to little point. Andrew Ryscavage, another district vice-president and leader of the Polish delegates, was also, at the opening of the convention, a determined opponent of the acceptance of the agreement. Toward the close of the proceedings, however, both he and Matti were eager to bring their followers to accept its terms. In my opinion, and I have attended a number of miners' conventions, at least three-fourths of the delegates to the convention, were determined to accept the tentative agreement at any cost.

Neither the operators nor the miners had anticipated that the general committee of miners would repudiate the work of their subcommittee. A great majority of the miners were indignant at the folly of this action, and it is certain that such an incident will never occur again, if the mine workers of the anthracite region can prevent it. It is now admitted that the committee acted not only illogically, but from the standpoint of the union, illegally in that it had no authority to reject the tentative agreement before its submission to the tri-district convention. This committee delegated its power to a subcommittee and in doing so, its executive responsibility began and ended.

After the convention had ratified the agreement, I asked a very intelligent miner of my acquaintance to give his opinion of the result. "We have secured a raise in our wages of 5 per cent.," he answered after a pause, "and that is all." I pointed out to him that there was a series of other provisions in the agreement that seemed to be of the utmost importance to the miner. He replied that theoretically these concessions were all right, but that a strong union was necessary to secure the full effect, or indeed any benefit, from these provisions and he feared that instead of the union becoming stronger numerically or financially during the next four years, it was in danger of disappearing altogether. In regard to the matter of a checkweighman, he continued, let us take as an example a mine employing 1000 men and boys where the union local numbers perhaps 120 or 130 members. How long do you think these union men will be inclined, or able, to pay the salary of a checkweighman, who is working for the men who do not contribute toward his wages, as well as for them?

There was great rejoicing among all classes in the anthracite region when this convention had come to an end. The mines are in excellent condition, nearly all of them having been thoroughly overhauled and made ready to begin operation as soon as the suspension was called off.

## Another Account of the Miners' Convention

The anthracite miners, convinced that the offer of the operators was the best contract they could secure, have decided to return to work and for the next four years will labor under the best conditions they have ever had.

The keen disappointment, which the men felt over what looked to them like very slight concessions, was removed at their convention here. When they settled down to a serious consideration of the proposition, they came to look upon it in a different light and were convinced that the coal operators had gone a long way toward conceding to them, some of the really big demands they had made.

Delegates began to assemble in Wilkes-

Barre on Monday, May 13, and it was plain from their expressions of opinion that many of them had determined to reject the tentative agreement and repudiate their leaders. National President John P. White came here with the sentiment of the men largely against him and with ugly rumors afloat, but he and other leaders were prepared to lead the men into an impassionate consideration of the whole matter.

To bring the question home to the miners, it was necessary for President White to bare secrets of the organization and present the case in its most forcible aspect. In his address on Thursday, by a presentation of plain, undeniable facts he showed the men the folly of their hasty conclusions and the dangers ahead if the convention decided to reject his advice and vote to strike.

President White first discussed the terms of the agreement. He took it up clause by clause and in a most able manner showed the men what each concession meant. It was an easy matter for him to show that the sliding scale was an uncertain factor, and that while it had been the means of securing them some extra money, as a business proposition it was not nearly as safe as a flat advance of 10 per cent. He discussed the awards and concessions, covering every point over which the miners argued and showed that out of 170,000 men in the anthracite field, there were less than 30,000 men in the union. He presented figures which showed that in recent years, the union's ranks had been thinned to 21,000 men and that after many organizers had spent months in the field, there were, at the end of March, less than 30,000 members.

### Finances of Miners' Union

From a financial standpoint, President White explained that the organization was in no shape for battle. He presented a statement showing that from 1902 down to last year the balance on hand had decreased from one and one-half million to about $250,000. He did not say just how much money the national treasury contained at this time, but made it plain that there was not enough money on hand to justify even the thought of a strike.

President White explained that the men of the anthracite region had so far forgotten their union that in the past two years it had been necessary for the national organization to pay back in per capita taxes and loans over $40,000, to keep the three districts' offices open. He referred to the fact that the anthracite men owed the national organization the sum of $750,000, which had been loaned during the struggle of 1902, and that there was no means at hand of paying this money back. He declared that if the men did not accept his advice and adopt the agreement, they knew just what they faced and any mistakes made would have to be borne by the men and not by the leaders. He put the situation squarely up to the men and declared that they must decide.

Before his address, there were enough delegates in the convention, opposed to the agreement, to defeat the proposition. When he had finished, sentiment began to change at once. Many of the instructed delegates went back to their local unions to present the situation to them and returned with orders to stand by White and the leaders. From this time on, the result was not in doubt. The men had been convinced.

The leaders were not content to let the proposition go to a vote at once. Other officials were called upon to make explanation of the concessions and tell the men what they faced. National statistician William Green made a splendid address and national board member Frank Farrington and the three district presidents all pleaded with the men to be governed by reason and accept what the companies had offered.

The opposition began to lose its hold, and by Friday afternoon there remained only a few instructed delegates who were willing to vote against the agreement. These delegates declared they would have to vote against the proposition even after they had been convinced that it was the best they could get.

By Saturday all doubt as to the result of the convention was removed. The leaders discovered some anxiety among the men to get back home and suddenly called for a vote. So certain were they that the agreement would be accepted that a standing vote was called for. Those in favor of the agreement numbered 323, while the opposition could muster only 64 votes. The convention came to a close after deciding that repairmen were to go back to work Monday May 20 and the miners on the Wednesday following

## The Coal Unloading Terminal at Sewalls Point

By Floyd W. Parsons

It is estimated that the anthracite field originally contained 19½ billion tons of coal. Of this total deposit we have mined approximately 2¼ billion tons, and for each ton marketed another ton of coal has either been wasted or left in the ground. It is evident, therefore, that upward of 15 billion tons of anthracite remain unmined, and that a long period of industrial activity may be looked forward to by those engaged in mining hard coal.

This great deposit of anthracite in Pennsylvania has furnished the chief source of income for nine important railroads. Mining as an industry in northeastern Pennsylvania has caused the building of many large towns and several great cities. If all this has been brought about by the exploitation of a great and valuable coal deposit, history will repeat itself in other states where similar natural resources are found.

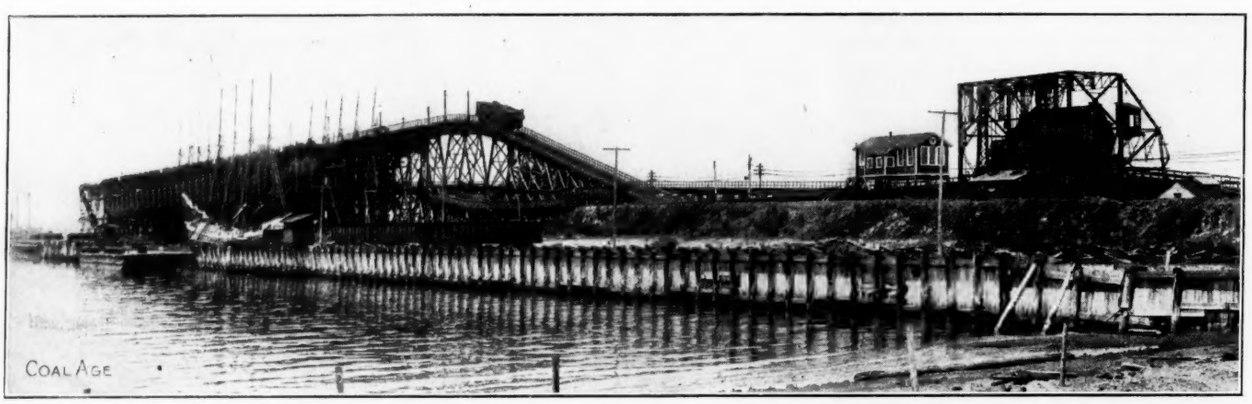
Showing Operation of Car Dumper at Sewalls Point. Contents of Railroad Car are Being Poured into the Pier Car

As compared with the immense deposit of anthracite, we have only to remember that more than 20 billion tons of coal lie tributary to any one of several great railroads in southern West Virginia. The Virginian Railway, for instance, must eventually carry such a tremendous tonnage to tidewater, and it is interesting to know the provisions that have been made at the seaboard for handling this great amount of bulky freight.

The coal-unloading terminal of the Virginian Railway is shown in the accompanying photographs. This pier is located at Sewalls Point, seven miles down the main stream of the Elizabeth River from Norfolk, Va. The equipment here installed is one of the largest and best

plants of its kind in the world. The total cost of the installation was more than $2,000,000. Its operation has immensely increased the importance of Norfolk as a coaling station, and Hampton Roads is now the largest coaling port of North America.

The maximum unloading capacity of the Sewalls Point pier is equal to that of all other coal terminals in the vicinity of Hampton Roads combined. Every labor-saving device worth including has been installed, thereby reducing by several hours the time required to load a vessel with either bunker or cargo coal. As a result of the advantageous location of the pier, so close to the main channel of Hampton Roads, the Virginia Pilots Association now brings vessels up at night, as well as by day, so that the pier runs on a 24-hour schedule. It is electrically lighted for the night work. At the back of the terminal is a large receiving yard of 185 cars capacity. The pier is 1045 ft. long and is built entirely of steel on large concrete foundations. Its average height is about 75 ft., above water level.




GENERAL VIEW OF SEWALLS POINT COAL UNLOADING TERMINAL. PIER CAR IS SHOWN AT TOP OF INCLINE APPROACH

The maximum capacity of the pier is more than 15,000 tons per day of 10 hours, or 4½ million tons per year of 300 working days. There are four berths on each side, so that eight vessels, not exceeding 200 ft. overall, can be accommodated. The machinery of the pier enables the handling of a railroad car every two minutes, or not less than 1500 tons an hour. This is done by means of a number of hopper-bottomed, electrically operated shuttle cars—called conveyor or pier cars—each of which receives an entire railway carload of coal at a time, carries it out on the pier, and unloads it through movable chutes into the vessel.

### OPERATION

Upon the arrival of a vessel to take a consignment, the switching engine pulls out from the yard tracks the proper number of cars and places them in the barney yard adjacent to the pier. From this point the cars are emptied and removed one at a time in rapid succession by the unloading equipment.

Each car is run by gravity to the foot of an inclined approach to the car-dumping plant, where it is engaged by an electrically operated barney hoist and pulled to the upper level of the car dumper. After being emptied by the car dumper (which operation is shown in the accompanying illustration), the car stands, until kicked off by the next succeeding car and is then allowed to run down an incline to the empty yard. The operation of the car dumper is to pick up the railroad car bodily from its position on the upper track and turn it completely upside down, so as to pour its contents down over a deflecting apron into a steel pier car of 60 tons capacity, which has meanwhile been brought into position on the lower track of the car-dumping plant. The empty railroad car is then returned to its normal position, ready to be kicked off by the next following loaded transportation car.

The railroad car's load of coal having been deposited in the pier car, the latter is allowed to run by gravity to the platform of a railroad scale, for weighing its load. This scale is automatic and records the net weight directly, and the car immediately passes by gravity to a point where it is engaged by an electrically operated barney hoist and pulled up a 25 per cent. incline leading onto the pier proper. On the pier, the car continues by gravity to the desired point over the vessel being loaded—air-brakes and air-operated dumping door in the hopper bottom enabling the car to be spotted and unloaded quickly through adjustable chutes. The empty pier car then proceeds by gravity and its own motors shoreward, back to the receiving position for its next load.

There are ten pier cars, and each one is fully equipped with the necessary electrical, pneumatic and mechanical apparatus. The bottom of the car is made up of four large circular undercut doors, operated either in unison or independently from a central shaft running the entire length of the car, and controlled from the operator's platform. Opening all the doors frees the entire bottom of the car so that coal cannot become wedged or jammed—a feature of superiority to ordinary hopper cars, which become clogged by freezing in winter and thereby delay unloading.

The use of the self-dumping conveyor cars with electric motors, air-brakes and pneumatic bottom doors eliminates the running of the railroad cars onto the pier, and the time and expense involved in poking clogged coal through the hopper bottoms.

## A Timber Puller

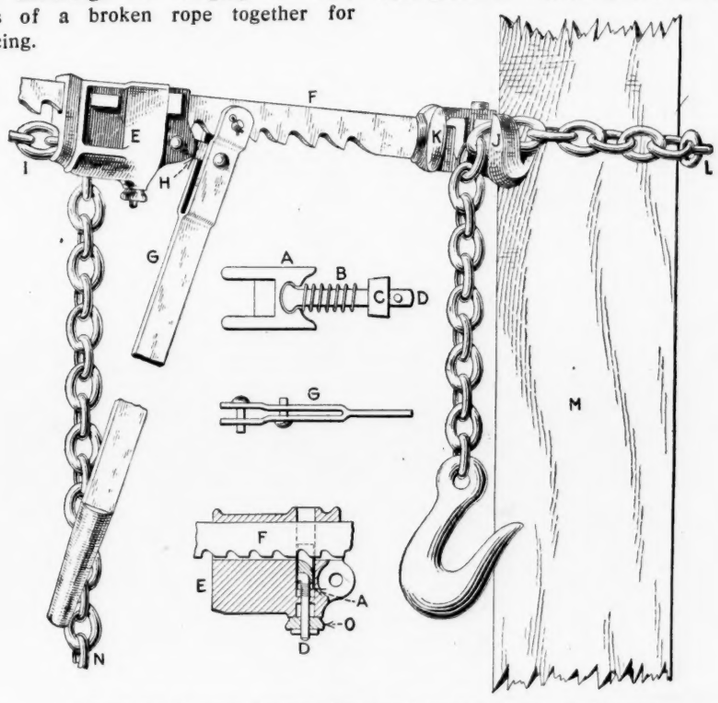
The operation of removing timbers is attended with no little danger. Even when the post is first set, the roof is often none too safe and the operation of driving it into place frequently makes the roof weaker both because of the upward lift of the prop and because of the jarring which accompanies the work. After a prop has stood for some time, the action of the air, the stresses resulting from shot-firing and the general roof strain weaken still further the material which the prop was erected to sustain and it cannot be safely drawn by the use of a sledge because the timberman must stand where the loosened rock cannot fail to fall if the roof is incapable of self support. Yet timber must be withdrawn and a fall obtained if other timbers are not to be burdened more than is safe and desirable.

### SAFE TIMBER PULLING

The "Sylat" timber puller furnishes the timberman with a means of withdrawing posts without leaving a place of safety. It will not only dislodge the timber but will drag it toward the operator. Moreover as a steady pull is exerted there is no strain on the roof such as is set up by the hammer blows of a sledge. This simple machine has been used extensively in the coal mines of England and Wales and has been adopted in the United States by some of the larger corporations. Being so simple, the puller

has the advantage of lightness and availability. It can be used in thin and heavily pitching seams as well as in those which are thick and level.

As may be imagined, it will not only pull timbers, but it has been used for moving heavy mining machines from one cut to another. It has aided in the placing of heavy machinery such as boilers, pumps, hoists, etc., both under ground and above. Where cars have been derailed it has been used to replace or to extricate them. For this reason it is a handy tool to have on hand on a plane where derailments are serious and frequent. Loaded cars are frequently moved with its aid and it can be used with advantage for bringing the loose ends of a broken rope together for splicing.




STYLE OF SAFETY TIMBER PULLER LARGELY USED IN EUROPE

THE "SYLAT" TIMBER PULLER

The "Sylat" timber puller consists of a toothed bar, or rack *F*, about 3 ft. long, having at one end swivel attachment *K*, and a chain block *J* to which a chain *L* (about 3 ft. long) is attached, this chain terminating in a hook. This chain is attached to the anchor post *M*. Sliding on the rack is a block *E*, carrying a ratchet lever and pawl by means of which the block is worked along the rod through the manipulation of a long steel handle or lever *G*. There is another chain *N*, about 15 ft. long, with a hook, which can be attached to the sliding block *E* at any point on the chain by slipping a link into a recess in the side of the block as shown at *I*. This chain is affixed to the post which it is desired to remove.

The pitch of the rack is slightly over 1 in. The length of the lever is such that the pull induced in the chain is thirty-two times the force applied to the lever handle. This pull is sufficient to start and move any timber. When the pawl or catchbolt *A* passes a rack tooth, it is forced in place by a spring *B;* and the lever *G* is then released and moved back one tooth for another pull. It is impossible for the block to lose its grip and spring back. Yet it can be easily and quickly released when desired by moving the lever *G* forward as if to make another stroke. This causes the pawl *A* to ride a rack tooth. While thus released the spindle *D* can be raised by lifting on the cross-bar *C* and placing it crosswise of the recess as shown at *O*.

The device throughout is made of the best grade of materials, with a view to withstanding the hard, knock-about service and frequent neglect or abuse to which almost any mine appliance is subjected. It is extremely simple, has nothing to get out of order or adjustment and can be operated by anyone in the most restricted places.

## Western Kentucky Strike Situation

The culmination of the conferences at Louisville, Ky., between the operators in the western Kentucky coal mining district, and the miners, came when the former submitted their "very best proposition." This was taken up several weeks ago at the joint convention of the miners and operators which reassembled at Central City. Pending a settlement of some slight differences, the miners voted for a resumption of work, the ballot being 1850 for and 425 against.

The scale as asked by the miners, and as offered by the operators, is as follows:

| | Asked by miners. | Offered by operators. |
|---|---|---|
| | Per ton | Per ton |
| Screened pick-mined coal | $0.925 | $0.925 |
| Mine-run pick-mined coal | 0.5725 | 0.5735 |
| | Per yd. | Per yd. |
| Yardage in pick entries. | 1.40 | 1.40 |
| In wide pick entries.... | 1.04 | 1.04 |
| | Per room | Per room |
| Turning rooms in pick mines | 4.18 | 4.20 |
| Loading in machine mines | | |
| | Per ton | Per ton |
| On screen-coal basis.... | 0.4648 | 0.4625 |
| On mine-run basis..... | 0.2916 | 0.2867 |
| Chain machine runners on screen-coal basis.. | 0.0691 | 0.0687 |
| Chain machine helpers on screen-coal basis.. | 0.0617 | 0.0613 |
| Chain machine runners on mine-run basis.... | 0.0435 | 0.0427 |
| Chain machine helpers on mine-run basis.... | 0.0387 | 0.0379 |
| Punch machine runners on screen-coal basis.. | 0.1328 | 0.1379 |
| Punch machine helpers on screen-coal basis.. | 0.0839 | 0.0835 |
| | Per day | Per day |
| Track layers..... | 2.45 | 2.46 |
| Track layers' helpers... | 2.23 | 2.24 |
| Bottom cagers..... | 2.23 | 2.24 |
| Drivers gathering with one mule..... | 2.23 | 2.24 |
| Drivers gathering with two mules ..... | 2.43 | 2.44 |
| Drivers gathering with more than two mules. | 2.43 | 2.44 |
| Riders ..... | 2.23 | 2.24 |
| Water haulers..... | 2.23 | 2.24 |
| Timbermen ..... | 2.45 | 2.46 |
| Pipemen ..... | 2.36 | 2.38 |
| All other inside day labor ..... | 2.23 | 2.24 |
| The minimum outside scale ..... | 1.79 | 1.80 |
| Trappers ..... | 0.75 | 0.76 |

## Michigan Coal Mining

The report of the inspector of coal mines for the State of Michigan states that there were 33 mines in operation during 1908. The average number of employees was 3087, working on an average of 7.8 hr. per day and 20.2 days per month. The total production of coal for the year was 1,839,927 tons. On this basis, 596 tons of coal are secured per year per man employed, or a little under 2.5 tons per day of 7.8 working hours. The oil consumption was reported at 33,966 gal., which is equal to about 11 gal. per man per year, or 0.045 gal. per day. The total amount of powder used was 73,857 kegs, or one keg for every 24.9 tons of coal mined. The average wage was $3.02 per man, and the average cost of mining, $1.67 per ton of coal produced.

As Tate indicated some years ago, when the roof has been continually chipping off over a long period, the top will at last come to rest, forming an arch of parabolic section. When this arch has once formed, it will be more durable and stronger than an artificial arch, or a road that is strongly and expensively timbered, providing there is no subsidence of the supporting pillars. After such an arch has been formed and the removal of the coal is still continued, the parabolic lines may extend upward indefinitely.

# The International Red Cross Conference at Washington, D. C.

By M. J. Shields*

The Red Cross Societies of many nations held a conference at Washington, to compare methods of saving lives, and in connection with that convention on May 11 at 2 p.m. held a "first aid"' competition and exhibition meet.

The first and leading event was a contest in first aid, in which no less than forty-five teams took part, representing seven different classes of Red Cross first aid work; to wit, the hospital corps of the United States Army, the police departments of the District of Columbia and of the City of Philadelphia, the fire department of that city, the women's first-aid detachment, the miners' first-aid teams, the boy scouts and the field corps of the American Red Cross.

The competition was not general, but teams of each group of first-aid workers competed against other teams in the same group and had separate judges. Those apportioned to adjudge the miners' work were Major Chas. R. Reynolds, Major Matthew A. De Laney and Captain Howard H. Baily of the Medical Corps of the United States Army. I desire to speak in terms of the highest praise of the work of the miners' teams, which received the unstinted praise of the spectators.

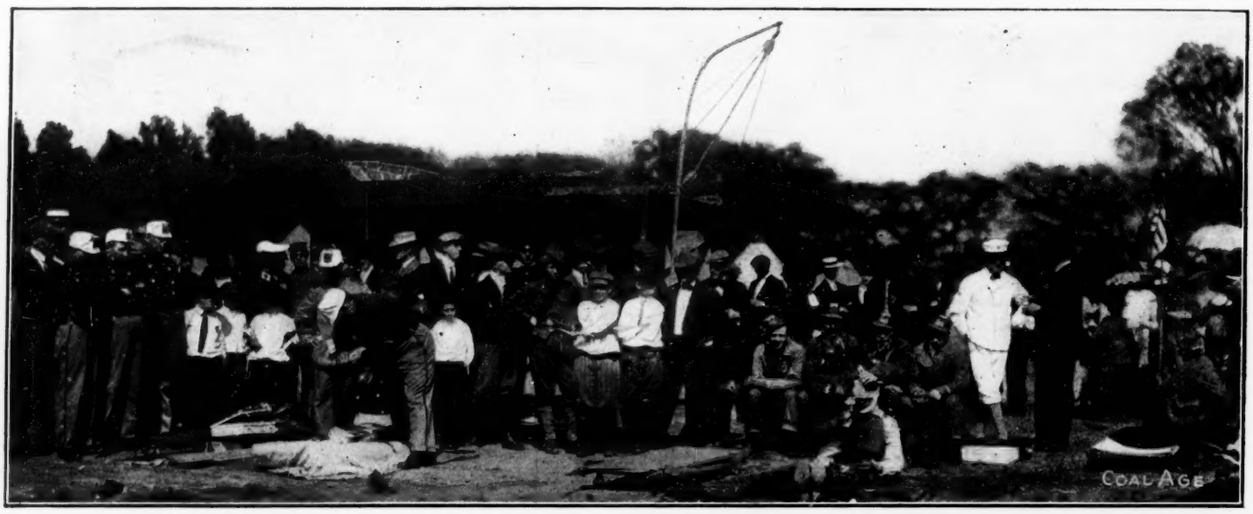
Three problems were presented to each team, and in all there were eighteen army and navy officers to render judgment on the work performed. The H. C. Frick Coke Co., the Pennsylvania Coal Co., the Price Pancoast Coal Co., and the Illinois State Mining Department each had a competing team, while the Delaware, Lackawanna and Western Railroad Coal Mining Department showed its enthusiastic interest in life saving by entering no less than three teams.

The following were the winners among the miners: First prize, H. C. Frick Coke Co., a silver loving cup; second prize, Delaware, Lackawanna and Western Railroad Coal Mining Department; third prize, Price-Pancoast Coal Co. Among the mining men present were: J. A. Holmes, H. M. Wilson, Geo. S. Rice, H. H. Stoek, W. A. May, C. E. Tobey, F. H. Coughlin and Drs. Roundtree, Carraway and Head.

A section of a mine was represented, and at 4 p.m. three typical mining accidents were illustrated, a fall of roof, the ignition of a feeder of gas with a naked light, and a fire in a mine. This latter was extinguished by helmet men under the direction of J. W. Paul. The rescue and first-aid work in connection with these demonstrations was illustrated by the Pennsylvania Coal Co.

Other interesting items were an exhibit of the loading of a hospital ship at sea, and an exhibition drill by the Illinois Field Corps of the American Red Cross. The meet was under the charge of Major Chas. Lynch, Medical Corps of the United States Army. Major Lynch and myself desire to thank all those who aided us in making the meet so successful.

*Manager, First Aid Department, American Red Cross.




Miners Ready for Action at International Red Cross Meet, Washington, D. C.

# Fuel Movement during First Quarter of 1912

An unusual increase in the volume of coal traffic has been reported during the first three months of the present calendar year, according to a publication just issued by the Bureau of Statistics, of the Department of Commerce and Labor.

### Eastern Movement

The shipment of anthracite coal from the Eastern producing territory, as reported to the bureau during the three months of January, February and March, 1912, 18,209,351 long tons, exceeded the shipments during any three months' period in the past decade. Over 25 per cent. of the total shipped, namely, 4,738,476 long tons, was handled in and around New York City for shipment to New York proper and other Atlantic ports. Coastwise shipments of anthracite from Philadelphia during this period totaled 539,855 long tons, while shipments reported from Baltimore were 62,117 long tons.

The bituminous-coal movement in the East during the first quarter of the present year, as reported by eleven leading roads, amounted to 36,818,505 short tons, as compared with 29,019,174 short tons during the first quarter of 1911, 31,773,043 short tons during the same period in 1910, and 23,701,359 short tons in 1909.

The coastwise shipments from the five principal Atlantic seaports amounted to 6,563,411 long tons during the first quarter of 1912, as compared with 6,480,418 long tons during the same period in 1911 and 6,307,403 long tons in 1910. Of the total coastwise shipments for the first quarter of 1912, 2,841,152 long tons were shipped from New York, 928,307 long tons from Philadelphia, 891,456 long tons from Baltimore, 677,133 long tons from Newport News and 1,225,363 long tons from Norfolk.

### River Movement

The river movement of coal, on the other hand, shows a much smaller volume during the first three months of 1912 than during the corresponding period in 1911. The shipments by way of the Monongahela River during that period in 1912, 2,105,610 short tons, were much smaller than during the same period in 1911, namely, 2,988,513 short tons.

The river movement during the month of March, 1912, taken as a whole, however, shows a slight increase, when compared with March of last year.

# Current Coal Literature

**The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign**

## The "New Nitrogen" in Firedamp*

It is well known that the "nitrogen" of air is a different gas from that derived from nitrogen compounds, and has a different specific gravity. It was this fact which led to the discovery that the inert gases in air were not nitrogen and carbon dioxide solely, but included argon, krypton, xenon, helium and neon in the following proportion by volume, as determined by Sir William Ramsay. So that overlooking niton, the latest discovery, we have the following composition for air:

PERCENTAGE VOLUMETRIC COMPOSITION OF AIR

| | |
|---|---|
| Oxygen | 20.941 |
| Nitrogen | 78.122 |
| Argon | 0.937 |
| Krypton | 0.000262 |
| Xenon | 0.000047 |
| Neon | 0.000115 |
| Helium | 0.000004 |
| | 100.000428 |

Through M. Le Chatelier, Messieurs Moureu and Lepape presented a paper on the percentage of these rarer gases in firedamp:

"We recently determined the volumetric relations of krypton to argon, of xenon to argon, of xenon to krypton and of argon to nitrogen in a large number of natural gases from thermal springs and in a volcanic gas. These various ratios are extremely constant, and their mean respective values are only slightly higher than those which obtain in atmospheric air.

"Having had occasion recently to study the rare gases found in firedamp, we sought to discover whether they would follow the same law of proportions found in gaseous mixtures of an entirely different origin.

"For this purpose we have calculated the argon-nitrogen ratio of the firedamp samples studied, and, by application of our spectrophotometric method for determining the proportions of krypton and xenon, we have been able to calculate approximately the ratios of krypton to argon, of xenon to argon and xenon to krypton. Further, we have been able to determine the values of the same ratios in a sample of crude argon, obligingly put at our service by M. Th. Schlœsing, Jr., who extracted it from the mine gases of Ronchamp, Anzin and Plat-de-Gier.

*Specially translated by E. P. Buffet for Coal Age.

RATIOS OF NITROGEN, XENON AND KRYPTON IN MINE GASES TO THEIR RATIOS IN AIR

| Source of Firedamp | $\frac{\frac{Ar}{N}\text{ (in mine)}}{\frac{Ar}{N}\text{ (in air)}}$ | $\frac{\frac{Kr}{Ar}\text{ (in mine)}}{\frac{Kr}{Ar}\text{ (in air)}}$ | $\frac{\frac{Xe}{Ar}\text{ (in mine)}}{\frac{Xe}{Ar}\text{ (in air)}}$ | $\frac{\frac{Xe}{Kr}\text{ (in mine)}}{\frac{Xe}{Kr}\text{ (in air)}}$ |
|---|---|---|---|---|
| Lievin, France | 1.38 | 1.4 | 1.2 | 0.9 |
| Anzin, France | 0.97 | 1.0 | 1.1 | 1.1 |
| Lens, France | 1.72 | 0.5 | 0.3 | 0.7 |
| Mons, Belgium | 0.82 | 1.3 | 2.1 | 1.6 |
| Frankenholz, Palatinate | 0.85 | 1.1 | 1.2 | 1.1 |
| M. Schloesing | 0.85 | 1.0 | 1.0 | 1.0 |

"We see that these numbers in general are quite close to one another and vary comparatively little from unity, which is the value of each of the ratios for air. Moreover, they are all (except three of the ratios, which apply to the firedamp of Lens) comprised between the extreme limits reached by the corresponding ratios of the gaseous mixtures previously studied. It seems permissible for us, therefore, to affirm that the ratios between chemically inert gases are as constant in the firedamps as in other natural gas mixtures. We should recall, in this connection, that Mr. Schlœsing has already observed that the ratio of crude argon to xenon in firedamp varies within narrow limits, and that it is sometimes very near to the value with which it occurs in the air.

### Absorption of Rare Gases

"Although the number of samples was limited, we could not fail to observe that the majority of the above ratios were smaller than the mean ratios for natural gases from thermal springs, while the ratios for the Lens firedamp were especially small. This remark leads us to think that in permeating through beds of coal to form, with the methane, the gas we term firedamp, the crude subterranean nitrogen (nitrogen plus rare gases) is selectively absorbed by the coal, and this results in lowering more or less the relative proportions of the heavy rare gases.

"Helium always exists in the *crude* nitrogen of the mine atmosphere, and often in abundant proportions. But its ratio to any one of the other inert gases is not at all regular. We know that this is true also, for the natural gaseous mixtures, and that is explained by the fact that helium is constantly produced by the decomposition of radio-active substances, and these are inequally distributed in the crust of the earth."

## Supplying Cities with Coke-Oven Gas

In the last five years the German papers have often discussed the project of supplying the larger cities with gas from the coke ovens; but many who have read concerning the project have never considered that coke is really a more important product of coal-gas works than gas. One thousand pounds of coal yield about 160 lb. of gas and 550 of coke, which, as a rule, is sold at a low price to local consumers. The local coke consumption is determined only by the necessary supply; but as the gas production increases as a rule, more rapidly than the population of the cities, there is usually a good supply of local coke at low prices.

But what would happen, asks *Hygiene und Industrie*, if all, or the greater part, of the municipal gas plants of the Rhenish-Westphalian district were to go out of service? There would be no more gas coke, and this would have to be replaced by iron-works coke. But this material, which has only about five per cent. higher heating value than the gas coke, costs thirty per cent. more; and the production depends on the condition of the market. If the cities are to be supplied with gas from the cokeries, the coal mines would have not only the gas monopoly but the coal monopoly as well.

Taking a concrete example—a city with an annual gas consumption of 1,059,000,000 cu.ft., would use up 100,000 gross tons of gas coal and deliver 55,000 tons of coke to local consumers. But if instead of gas coke the furnace coke was used, at $1.25 a ton higher price, the inhabitants would be "out" $68,750 a year; or to put it another way, the 1000 cu.ft. of gas would cost six cents more than where a municipality had its own gas works. So an examination of conditions leads to the conclusion that the municipal gas plants should not be vacated.

# Who's Who—in Coal Mining

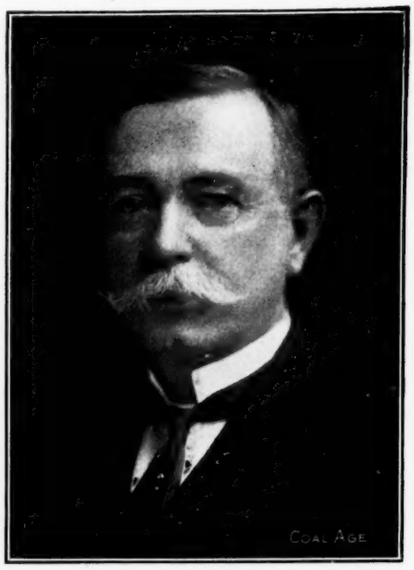
**Devoted to Brief Sketches of Prominent Men, Their Work and Ideas**

Believing in what you do is half the battle. A man leading a forlorn hope, but who can see only right and justice in his great effort, is likely to accomplish more in the way of execution than the fellow with the easy task whose heart and enthusiasm are not in his work. Earnestness of purpose may not be the greatest asset a man can have, but surely no other personal merit excels it in value. H. M. Chance is sincere and always believes in what he says or does. We don't know that he has ever led any forlorn hopes, but if he has it's ten to one that they were not forlorn when he finished with them. Concentration and serious intent are his chief characteristics.

Born at Philadelphia, Jan. 18, 1856, Mr. Chance was educated at the Central High School, later graduating from the University of Pennsylvania in the Civil and Mining engineering courses, as well as completing special work in geology under Lesley, the father of topographic geology. Immediately on leaving college in 1874, he became an assistant to Lesley, who had just been made State Geologist, and until 1884 "H. N." was located in the iron, oil and coal districts, reporting upon six counties in the western part of the state, and finally preparing a special report upon the mining methods and appliances used in the anthracite coal fields. In 1884-5, Mr. Chance conducted an examination of the Deep River and Dan River coal fields in North Carolina for the State Board of Agriculture, which was then performing the functions of a geological survey.

Having determined to obtain a practical knowledge of the operation of mines, and believing that a mine superintendent should be able practically to carry out the work he is called upon to supervise, he became interested in some iron-ore mines in Lehigh County, Penn., investing most of his capital in the venture. Mr. Chance here gained the experience he sought, but paid for it in time, labor and money. The ore was brown hematite, mined underground and required heavy timbering. It was worth $3 per ton delivered at the furnace. As he had to mine four tons of material to win one ton of ore, and since there were expenses of 35c. for hauling, 40c. for freight, and 25c. per ton for royalty, the profit was nothing unless the cost of mining could be kept at less than 50c. per ton.

Although he succeeded in keeping the mining charges at a low figure, the price of ore at the furnace soon fell to $2, which meant that the cost of mining would have to be reduced to less than 25c. per ton. Having no desire to attempt this impossible task, "H. M." retired from the venture, poor in pocket, but with an experience that enabled him to serve efficiently a firm of tunnel contractors during the next two years as their chief engineer and as assistant superintendent of excavation and construction.




H. M. CHANCE

In his study of mining methods while in the Pennsylvania Survey, Mr. Chance became interested in ventilation, in the hygiene of mines, in the effect of pathogenic and dusty mine atmospheres on the men, and in the question of first aid to the injured. This was long before the organization of first-aid corps was effected. In order to grasp these subjects, he commenced the study of medicine, and in 1882 was graduated from the Jefferson Medical College with the degree of M. D.

In 1885 Mr. Chance made some examinations of coal discoveries in Mexico for the Mexican Central Railroad Company. In 1887-8 he conducted an exploration for fuel supply for the Chicago, Burlington & Quincy Railroad Company, finally developing the coal field at Cambria, Wyoming, which was recently described in COAL AGE, and which since 1891 has furnished a large part of the fuel supply of that road for its lines west of the Missouri River.

In 1889 he located, selected and developed coal lands for the Choctaw Coal & Railroad Company, tracing the coal from McAlester eastwardly to the Arkansas line, a distance of about 100 miles, and discovering and developing the Grady coal basin and locating the railroad through it. The road was built and the mines were opened and operated successfully under the able management of Edwin Ludlow, until the property was finally absorbed by the Rock Island system.

In 1889 he permanently located at his present headquarters in the Drexel Building, Philadelphia, and has since then been engaged in a general consulting practice in geology and mining engineering. During this period, he has served many of the larger bituminous and anthracite coal-mining companies, especially in the solution of difficult problems, in matters effecting the purchase and sale of properties, in disputes over boundaries, and in arbitrations and appraisals. He has given considerable attention to the supervision of exploratory diamond drilling and other development work to demonstrate values and quantities.

In the boom mining period which followed the discovery of Tonopah, Nevada, in 1901, and which lasted until the decline of Rhyolite, Greenwater and other camps that failed to "make good" about 1907, Mr. Chance was engaged in the examination of minor prospects and a number of metal mines. In all his work as a consulting engineer, he has developed or reported upon coal properties in at least 20 states and territories, iron mines in half as many localities and precious-metal properties in western states and Mexico. In fact, it is probable that no engineer in America has had a wider and more diversified experience than H. M. Chance, and as an authority on the working geology of the United States, few operating engineers are his equal.

He originated the movement that led to the organization, four years ago, of the Mining and Metallurgical Society of America, in which movement he had the warm coöperation of F. L. Garrison, and the benefit of the suggestions and support of Prof. H. S. Munroe, J. F. Finlay, W. R. Ingalls and several other celebrated engineers.

He has been an occasional contributor to various techincal journals, and to the Proceedings of the American Institute of Mining Engineers, Engineers Club of Philadelphia, Mining & Metallurgical Society of America and American Phil. Society, of all of which organizations he is a member.

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*This journal has a direct aim—a single purpose—which is to help advance the coal-mining industry. Its creed embodies the dissemination of knowledge and the free interchange of ideas among its readers, all of whom are invited to become regular contributors.*

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# COAL AGE

## The Anthracite Wage Settlement

The anthracite suspension has ended, and all hope that the miner and operator would emerge from the turmoil with a satisfactory and permanent working agreement was vain. It is true that in an editorial of May 11, we urged the miners to accept the offer made them by the operators, but this stand was taken because it was apparent that some miners were not satisfied with the provision assuring peace for four years, but were desirous of the opportunity of resuming strife with every returning spring.

We cannot congratulate the miner on what he has forced the operator to concede. It is true that his wages have been raised, but he has also obtained, not merely the right to agitate, but also the need for agitation. He who receives a flat wage, which does not change with the flux of economic conditions, which regards neither the ability of the wage to purchase a living, nor the price at which the commodity produced is sold, nor the right of the workingman to benefit by newly developed instruments of production, is bound before long to be dissatisfied and strike.

It was in view of this fact that we had hoped that the miner would have urged successfully an agreement so flexible, so self-molding to all the changes of circumstance, a wage at once scientific and sufficing that the cost of agitation and the wages of unrest would have become as unknown as the desire for protest.

It is the more to be regretted because the defects of the agreement are those which the miner has himself sought through his representatives. If we mistake not, he opposed himself to arbitration, the sliding scale and the conciliation board and prepared himself for a battle, to be followed by four years of skirmishes, foraging expeditions and the like. He has scheduled another battle to take place four years from the present date, so that the air is thick with frays and rumors of war.

This seems perhaps a strong characterization of the labor situation, so much have we become used to "excursions and alarums," especially in the bituminous fields. We have accustomed ourselves to a seething state of agitation and discontent and we do not realize now how uncalled for it all is and how easily it might be avoided, if only a little solid thinking could be made to replace the prejudices which too often animate both parties to the controversy.

The recent quarrel was amicably conducted. What physical violence was shown, was due only in the most indirect way to the action of the union, and it would be unfair to ascribe any blame to that organization. The operators' and miners' representatives met in a most friendly manner and discussed their differences, but while all manner of courtesy graced the quarrel, men were idle, the productive energies of coal mining stood still and war is no less war though the combatants are knightly.

From his conduct of the struggle we draw the conclusion that the miner is not seeking stable conditions, but is arranging an atmosphere of discontent, to be followed by biennial, triennial or quadrennial triumphs of discord. The more frequent the disturbances the better he is pleased. Agitation, like machinery, needs more than oiling. It seems generally conceded that the parts must be set in motion frequently in order to secure good results.

How much better it would have been if the matter had been left to a conciliation board consisting of seven members, three representing capital and three labor, and one a competent statistician chosen by both parties. On the latter should devolve the duty of making a continued investigation of the cost of living, and of preparing a special index of cost prices, based on the actual purchases of the average miner. Wages should vary with the selling price of coal, as they have ever since 1903, but they should also increase with the increased cost of living.

Of course, whatever increase in the selling price of coal may result directly from a rise in wages, should not be recognized by a conciliation board as a cause for an increased wage; the tide-water basis should be raised by an amount equal to that increase of wage, whenever the price of labor is adjusted.

We do believe, however, that to maintain the relative level of the miner with other classes of workmen, the wage increment should be dependent not only on an increased selling price, and on the growth of the cost of living, but also, in a rough degree, on the productivity of all labor engaged in the output of those things which the miner consumes. Year by year the time expenditure on articles is reduced because of the invention of new means and facilities of production. In this increased productivity of labor, all should share. In the manufacture of iron, for instance, labor-saving methods have immensely reduced the labor expended. Labor *should* benefit, under past conditions *has so* benefited and, unrestricted, *will* in the future benefit by this improvement.

In fact, the well-being of the European workingman, despite the waning natural resources of that continent, is due to increased productivity resulting from an extensive use of machinery, which use has cheapened the products which he has to purchase. Had the old hand-labor processes been retained, the condition of labor in Europe would have become increasingly distressing.

When the last word is said, the laborer is entitled to a proportionate share of other men's labor. To determine the equivalence of a man's toil is by no means easy, but we think it should be attempted. It might be well tried for ten years, even if after that time a revision might be permitted on appeal of either party. Such an arrangement would be preferable to one which bluntly calls for an agreement on the basis of blind force, followed by unaltered wages for four years, regardless of changing conditions and ending in another test of strength four years hence.

## Sulphur in Coal

Our stereotyped methods of analysis do not bring out the condition of the sulphur in coal. The tendency of foreign scientists, however, is to emphasize the importance of that sulphur which is contained in unstable compounds. Many foreign analyses list the sulphur emitted at low temperatures separately in giving proximate determinations, stating what proportion is emitted at or below some definite degree of heat. Anyone taking a whiff of the gases from a newly charged coke oven will realize that the sulphur which is loosely combined is to be found in large quantity in most coking coals. The odor from the oven is much reduced when the charge becomes hot, as the sulphur is not so rapidly emitted at high temperatures after the loosely combined sulphur compounds have been driven off at a low heat.

The sulphur, which is thus loosely combined or entirely free in the coal mass, can be eliminated in coking, and is, therefore, not objectionable as a constituent of a coal prepared for use in the manufacture of coke. On the other hand, it is believed that coal, the sulphur of which is not largely in combination with iron or calcium, may be peculiarly subject to spontaneous combustion. If pure sulphur and iron filings are wetted, covered over with clay and gently heated, their mutual chemical action creates such heat that the resultant emission of steam makes the mass burst with some violence, so that the presence of iron and water would, it would seem, aid in hastening the heating of the coal.

Investigators should study this problem instead of assuming, as is done too often, that pyrite or marcasite is the probable cause of the heating, and, after proving that those minerals are not to blame, decide that sulphur cannot be the cause of the trouble. It is significant that those coals, which have been devolatilized in their early history, forming anthracites and near-anthracites, are not subject to spontaneous combustion.

It is possible that the heat which devolatilized them removed not only the bituminous content, so called, but that part of the sulphur content which was not in combination with iron or calcium, and which was, in other words, not a part of any stable compound.

If the presence of iron in stockpiles of coal aids in heating, as suggested, it might be easy to trace its effects. This theory of spontaneous combustion will explain why water only encourages an incipient fire, and why heating occurs largely where oxidation is clearly at a minimum.

## Discipline at Industrial Works

A high efficiency in operation at any industrial plant will be obtained only when a thorough and effective system of disciplining is in force. The employee at such a plant feels intuitively that his efforts are known and appreciated, which is probably the greatest incentive to continued and sustained application that can be offered the average self-respecting man.

To imbue such a spirit in the working personnel at our collieries, the superintendent or foreman must carry an ever-increasing record of each man in his mind. That such records must eventually become confused and lead to serious and reprehensible mistakes in the judgment of the men is inevitable, and every coal official knows the loss of prestige which results from such inconsistencies.

In an effort to overcome this deficiency, the Hudson & Manhattan Co., operating an extensive subway system in New York City, has recently made a radical innovation in this respect. This consists of a system of demeritage, whereby employees are disciplined according to record, the discipline being confined to one of three things—reprimands, demerit marks and dismissal.

Demerit marks are imposed, according to a fixed scale, for violation of rules, neglect of duty, accidents, etc., and when a total of 60 has been reached, dismissal automatically follows. No demerits are inflicted without first giving the delinquent an opportunity to defend himself, and the records are kept private, except as regards the man himself and the company officials.

As an offset to the demerits and an incentive to further effort, there is also a system of merits. Thus an employee receiving no demerits for six months is credited with 10 merits, and in a like proportion for deeds of heroism, loyalty, good judgment in emergencies and suggestions for the prevention of accidents and damage to the company's property. Each merit cancels one demerit.

One of the principal advantages of such a system is that it permits a man who has either wilfully or unintentionally got in trouble to redeem himself. It should also stimulate the employees to exert their best efforts and effect a greater harmony and spirit of coöperation among them.

# Discussion by Readers

**Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men**

## Thick Vertical Coal Seam

Referring to the question of Charles F. Sherman, COAL AGE, Apr. 6, p. 851, *re* best method of developing a vertical seam of coal, 16 ft. thick, to a depth of 1000 ft. and one mile long, would say I would be glad to answer this question if Mr. Sherman had given the data necessary, in such a case, to enable one to judge of the conditions and arrive at a satisfactory conclusion. Mr. Sherman has failed to state the character of the coal, the nature of the overlying and underlying strata, and to explain the surface conditions and whether the seam is gaseous or free from gas.

After an experience of 25 years in the working of thick pitching seams of anthracite, bituminous and lignite coals, I consider it would be almost impossible to give a satisfactory answer to the question asked without having the above information. To answer the question as it stands, it would be necessary to assume the conditions named above, and the assumed conditions would probably be different from those that actually exist and with which the engineer must contend. The answer in that case would be of no value to him.

J. W. POWELL,
Mine Manager.

Coalmont, B. C., Canada.

In response to the above letter, Mr. Sherman sends the following:

In regard to my inquiry published in COAL AGE, Apr. 6, p. 851, would say that the vein, which is practically 16 ft. in thickness, extends nearly vertically to a depth of about 1000 ft., where it starts to flatten out. The coal is a good hard lignite; and as yet no gas has been found. The hanging wall (roof) is a soft sandstone, while the footwall (floor), at present, is a fireclay, which, however, we expect will be replaced by sandstone, at greater depths. The property is located in a mountainous region, where the surface conditions are very rough.

CHARLES F. SHERMAN.

Farmington, Ill.

## Standards in Coal Washing

The article on "Standardization in Coal Washing," by G. R. Delamater, of Denver, Colo., in the March issue of *Mines and Minerals*, gives a complete method of determining the efficiency of washing coal. In the issue of Sept. 29, 1904, of the *Engineering and Mining Journal*, under the heading of "Standards in Washing Coal," attention was called to the lack of any standard methods of determining plant efficiencies, whereby the superintendent of a washery could compare his results with those obtained by others. I believe this subject to be of such importance as to warrant the republication of that editorial, which was as follows:

STANDARDS IN WASHING COAL

Proximate analyses of coal showing fixed carbon, volatile hydrocarbons, sulphur and ash and fuel value in thermal units are of high value to the consumer, and also to the producer, and we hope the day is not far distant when grades will be bought and sold on a guaranteed analysis rather than on the strength of some sort of a trade name. In connection with this matter of coal analysis we call attention to the needs of producers for new data. One of the new developments in the coal industry is the opening of thin seams of poor quality in territory where thicker seams of better quality are not far distant. This development is due as yet not so much to the exhaustion of the good seams as to the high price of good coal lands in districts convenient to our great manufacturing centers and the control of coal lands by great corporations. It is now cheaper in some localities for a newly formed corporation to get title to lands carrying thin, poor seams and use the latest methods of mining and preparing the coal than to get lands carrying coal seams more easily worked and made merchantable. This applies particularly to coking coals.

By washing the coal and by using ovens of improved type excellent coke can be made from seams that show very poorly on analysis. There can be no question, therefore, of a decided increase in the proportion of coke made from washed coal, and in the great extension of coal washing. The matter to which we call attention is the lack of any sort of a standard by which results obtained in washing, particularly in washing rather finely ground coals, can be compared. Analyses of the run-of-mine coal and of the washed coal are valuable, but owing to the variations in the physical structure of coals and the contained impurities, are not sufficient. What the superintendent of a coal-washing plant wants is a standard by which he can make a direct comparison between his work and the work of another man as published in the proceedings of some society or the columns of some mining publication—that is a standard specific gravity test.

It is customary to test the working of washing plants by using solutions dense enough to float coal; in this way the amount of heavy impurity in the washed coal and the amount of coal in the sludge can be determined quickly and with sufficient accuracy for ordinary purposes. The trouble is, when it comes to comparing results, that most papers on coal washing do not state what was the specific gravity of the fluid used.

While it is not possible to use fluids of the same density for all coals, yet it is highly desirable that the specific gravity of the fluid used should be stated. We call the attention of the superintendents of coal-washing plants and manufacturers of washing machinery to this important matter.

The method outlined by Mr. Delamater seems to follow along the lines suggested in that editorial, as all of his formulas are based upon the specific gravity or the float-and-sink test, as he terms it.

I think that the one great value of Mr. Delamater's method is that the separations are made in an exactly similar manner to that which must be employed in the actual washing of the coal, with the exception that a specific-gravity bath is used for making the float tests; this method Mr. Delamater assumes to be the only one having an efficiency of 100 per cent.

However, I should be glad to have the opinion of other readers on this subject, and if any have better methods to suggest, I hope they will be allowed to make use of the columns of COAL AGE to present them. Discussion by those familiar with the subject should result in a standard method being adopted which will be of great assistance to all engaged in this work, and, I think, will go a long way toward the attainment of a higher efficiency in the washing of coal.

It is certainly better to know exactly what one is doing in comparison with others, and I do not think this has been possible in the past with no standard methods of determining efficiencies.

New York City. S. T. A.

## Mine Car Construction

I was interested in Mr. Shurick's article on mine cars, COAL AGE, May 11, p. 1008.

The chief requirements for good mine cars are strength, lightness and durability. Where the gradient of the road is not heavy, and the load to be carried does not exceed 1500 lb., wooden cars, strengthened by flat iron bars, give good results. They will stand a fair amount of rough handling, are easily repaired and are not so easily knocked out of shape as iron or steel cars. They are also much cheaper to build than other forms of mine cars.

Red Lodge, Mont. B. H.

# Inquiries of General Interest

**All Questions Must be Accompanied by Name and Address—Not for Publication**

## Coal and Mineral Pitch

Are deposits of pitch very commonly associated with the coal measures; or what is the origin of this substance and where do the largest deposits occur? Is there any large quantity of coal in the Philippines?

PROSPECTOR.

Boulder, Colo.

[Pitch is the black, viscous residue that results from the distillation of coal tar and other bituminous substances. Mineral pitch (asphalt) occurs naturally and is the result of the evaporation of petroleum, which has escaped through the pores and crevices of the containing rock strata, into the atmosphere. The occurrence of petroleum and pitch deposits is not necessarily associated with the coal measures, although their modes of formation and origin are analogous. The petroleum-bearing rocks are the sandstones and limestones, but not commonly the shales.

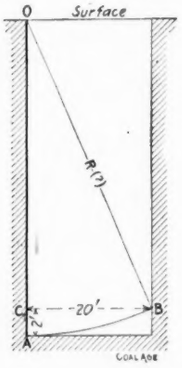
The same metamorphic agencies of heat and pressure that operate to change bituminous coal into anthracite, also assist the evaporation of petroleum and the production of asphalt or mineral pitch. The large deposits of pitch found in Mexico, California, Venezuela, Trinidad, West Africa, Borneo and Russia testify to vast quantities of petroleum which have escaped into the air. The composition of the residual pitch varies according to the degree of oxidation and evaporation of the oil.

Pitch is often found in conical masses from a few inches to 50 ft. in height. Each cone is symmetrical, and while the outside is hard and dry, the center is a little crater from which the flow has occurred. The largest pitch deposit in the world is Pitch Lake, Trinidad. This covers a quarter of a square mile.

As far as has been discovered up to the present time, there are four principal seams of coal in the Philippine Islands, all bituminous. These deposits, it is believed, amount to many millions of tons. The coal deposits in these islands is of increasing commercial value; and its importance to the United States as a coaling station cannot be overestimated. The field is as yet wholly undeveloped and unexplored, and for this reason no accurate information is obtainable relative to the depth or extent of the deposits. In this connection the article published last week, COAL AGE, p. 1054, will be read with interest.—EDITOR.]

## A Shaft Problem

Please give a solution of the following problem in COAL AGE, as soon as you can: A bob attached to a string is suspended from the top of a shaft 20 ft. wide, and just touches the bottom. When the bob is swung to the opposite side of the shaft, as shown in the accompanying sketch, it lacks 2 ft. of touching the bottom. What is the depth of




SHOWING CROSS-SECTION OF SHAFT

the shaft? This question has caused considerable discussion here and a great many different answers have been given. We would therefore like to have the correct solution and the rule for obtaining the same.

Johnston City, Ill. R. R. HUDSON.

Assuming that the string is attached to the side of the shaft, at the surface, as represented in the sketch, the question involves a simple geometrical principle.

The depth of the shaft ($OA$) is the radius of the arc ($AB$) described by the bob. The sine of this arc is $CB = 20$ ft., and its versed sine $CA = 2$ ft. But, from a simple principle in geometry, calling the chord of the arc $AB$ instead of the arc,

$$(AB)^2 = 2\,OA \times CA$$

$$OA = \frac{(AB)^2}{2\,CA}$$

But

$$(AB)^2 = (CA)^2 + (CB)^2$$

Hence

$$OA = \frac{(CA)^2 + (CB)^2}{2\,CA}$$

To find the depth of the shaft, in the present case, substitute the given values in the last equation: $CA = 2$; $CB = 20$; and

$$OA = \frac{2^2 + 20^2}{2 \times 2} = 101 \text{ ft.}$$

## Drawing Pillars

I would like to call attention to what seems to me may be an oversight in the illustration on p. 981, COAL AGE, May 4, showing a good system of drawing back pillars by machines. It seems to me that since the entries, in this case, have been driven to the boundary and the work is all retreating, the rooms should be widened on the other side, or outby, so as to make the road and the straight rib on the inby side of the room. I want to ask if, in drawing the pillar between rooms 30 and 29, you would not lose the next one between rooms 29 and 28, and would not this be the case the entire length of this entry; would not every alternate pillar be lost? Should not the rooms, in this case, be widened on the outby rib?

PENNSYLVANIA FIREBOSS.

Hites, Penn.

[The usual plan is to widen the rooms on the far rib, in the direction of advance. In the present case, the work being retreating, the rooms, by the usual method, would be widened outby instead of inby as shown. The question, however, is open to argument, and can only be properly decided, in any given case, by the prevailing conditions of roof, floor and coal. With a fair roof and bottom and good coal, if a systematic method of timbering is preserved, there is hardly any question but that better coal will be obtained by working the pillars from the side toward the falls. The crush on the pillars will not then be as great as when the pillars are cut from the other side and worked toward the falls. In the latter case, the last end of each little stub would be badly crushed, if not wholly lost, and a heavier roof fall might be expected to follow its extraction, endangering the work.

In considering the question, regard must be had to the line of break following up and paralleling the line of pillar work, and unless conditions prevent doing so, the pillar coal should be worked back constantly away from the falls. The same principle holds here as when the pillars are worked back on end; or as in longwall retreating. Under some conditions, however, it would be necessary to work the pillars from the outby side or away from the falls, and get as much as possible out, leaving the rest.

The question is open to argument and we gladly invite its free discussion by our readers.—EDITOR.]

# Examination Questions

**Selected from State Examinations, or Suggested by Correspondents**

## Iowa Examination for Mine Foremen Held at Des Moines, April 9-10, 1912

*(Selected Questions)*

*Ques.*—What should be the volume of air for a mine producing 1000 tons of coal per day, and what would be the effective horsepower of the ventilator, with a 1-in. water gage?

*Ans.*—The number of inside employees corresponding to this tonnage, basing the estimate on the last Iowa report, would be about 650 men and, say 20 mules. The minimum volume of air required by the Iowa mine law would then be

| | | |
|---|---|---|
| Air for men | $650 \times 100 = 65{,}000$ | cu.ft. per min. |
| Air for mules | $20 \times 500 = 10{,}000$ | cu.ft. per min. |
| Total | 75,000 | cu.ft. per min. |

The effective horsepower for this circulation, under a 1-in. water gage would be

$$H = \frac{75{,}000 \times 1 \times 5.2}{33{,}000} = 11.8\ hp.$$

*Ques.*—What plan would you adopt to fix a water gage at the intake to indicate the mine resistance where a furnace is used?

*Ans.*—In order that the water-gage reading shall indicate the total mine resistance, exclusive of the shafts, it must be placed on a brattice dividing the main intake from the main-return airway. In case the mine is so arranged or the furnace shaft so located that this is not possible, the reading may still be taken so as to show the difference of pressure between the main-return airway, at the foot of the furnace shaft and the outside atmosphere, by connecting one end of the gage glass with a pipe leading to the surface; or the reading may be taken on the surface by connecting the gage with the closed mouth of this pipe leading down into the mine. In any case, the gage must be so placed and connected that its two arms will be open, respectively, to the main-return airway, at the foot of the furnace shaft, and the main-intake airway, or the atmosphere. In the latter case, the reading obtained would include the resistance of the downcast shaft, in addition to the mine resistance.

*Ques.*—How should a stable in a new mine be constructed and ventilated?

*Ans.*—The accompanying diagram (Fig. 1) shows one of many good arrangements for a mine stable at the shaft bottom.

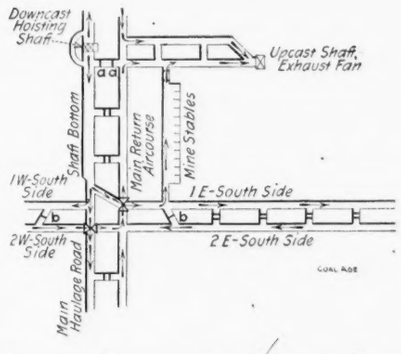



FIG. 1. SHOWING LOCATION OF MINE STABLES AT SHAFT BOTTOM

The principal points to be considered in the location of a mine stable are the following, in the order of their importance: 1. Easy access to shaft or slope bottom to facilitate the handling of the daily supplies and refuse between the surface and the stable, and the rescue of the mules in case of accident. 2. Good ventilation, water supply and drainage. 3. Fireproof construction and electric lighting, or protected lamps. 4. Ready access by good roads to the several districts of the mine. 5. Ample protection from roof falls, squeeze or creep.

In the plan shown in Fig. 1, the stable is located in the solid shaft pillar, between the intake airway of the first pair of cross-entries and the main-return air course leading to the upcast shaft. This arrangement allows an unobstructed entrance on the 1-E cross-entry. The other entrance leading to the main-return airway is protected by the two iron regulator doors, which control the "scale" of air taken from the fresh-air current on the 1-E entry, and afford ready access to the air shaft and the north side of the mine; or, by the double iron doors *aa*, to the main hoisting shaft. A 40-ft. pillar of solid coal separates the stable from the main-south-return air course. The floor of the stable is concreted and drains into the main sump at the shaft. The stalls and other fittings, as far as practicable, are of iron. The stable is furnished with a good supply of drinking water for the mules, and is equipped with fire extinguishers, hose and pipe-line attachments at points sufficiently protected and numerous that one or more of these will be available in case of need.

*Ques.*—What does a low water gage, with a large quantity of air passing, indicate?

*Ans.*—This condition indicates an economical expenditure of power to the extent that the ratio of water gage to quantity approaches a minimum for that mine. It shows a large air volume per unit of power expended. It shows a comparatively small rubbing surface per unit of *area of passage* or the total sectional area of all the splits combined. It shows a comparative freedom from falls or other obstructions in the air courses, and an ample size of breakthroughs in rooms and entries. Such a circulation approaches the ideal.

*Ques.*—How would you proceed to turn a cross-entry at right angles to the main entry without using a compass?

*Ans.*—Suspend a bob from each of the two respective points or stations *A* and *B* (Fig. 2) of the entry survey.

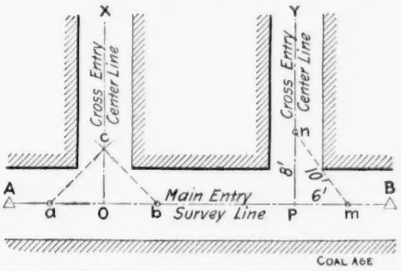



FIG. 2. SHOWING TWO METHODS OF SETTING OFF A RIGHT ANGLE WITHOUT USING A COMPASS

Stretch a string carefully in line with these bobs or points. By means of this string, line in the points *O* and *P* opposite the centers of the respective cross-entries. Also line in the points *a* and *b*, respectively, at any convenient equal distances, on each side of *O*. Then from these points *a* and *b* as centers and with any fixed radius *ac*, greater than *aO*, describe in turn the intersecting arcs which determine the point *c* and the line *OX* at right angles to *AB*. These lines can often be laid off with chalk on the roof, but the work requires care.

In a similar manner the triangle *Pmn* may be laid out, using the numbers 3, 4, 5 or any multiple of these more convenient, as 6, 8, 10 ft. This gives a right triangle, because

$$6^2 + 8^2 = 10^2$$

and makes the line *PY* at right angles to *AB*.

It is important to remember that all measurements must be made in the horizontal plane for any angle other than a right angle, which can be laid out on the pitch.

# Sociological Department

**For the Betterment of Living Conditions in Mining Communities**

## The New Dangers of the Pittsburg Coal

By Sim Reynolds* and W. H. Reynolds

Despite the work of the Bureau of Mines, of the state mine inspectors and of the technical journals, we find a dangerous adherence to old beliefs and a reluctance to accept new light on industrial problems. I recall an old practical miner, who went down to the Bruceton experimental mine. His features bore the inevitable blue stamps of the practical miner, and his knuckles, stiff and calloused, showed how long an acquaintance he had had with actual mining work.

He had been sent to Pittsburg "to see what the Government chaps were up to anyway," and he arrived seemingly determined to accept nothing on faith, nor was he prepared apparently to accept the tests and statements of more scientific men than himself, no matter how conclusive their theories might be—to them. This old mining official had, perhaps, many a time sought a "cap" in his burnished Davy, years before we were efficient to the point where we could open and shut a door on the main haulway. As he ambled about, he convinced us that there still existed, if not among the younger men, at least among many of the old school of mine officials, who are equally charged by the state with the care of many human lives, such a narrowness of mind and viewpoint, as is certain at some time or other to be the cause of a disaster.

In this particular instance, the man had evidently been sent by his employer to witness the demonstration. He passed through the mine previous to the explosion, and at frequent intervals made tests for methane. This not being in evidence, the old man very carefully examined the coal dust lying on the shelves, and even took the additional precaution to gather a handful, placing it in an envelope with deliberation and distrust. This dust he carefully sealed and put away for further examination.

"There may be something in it besides coal dust," said he, doubtfully. And after waiting for the "blow-up," while the first few ineffectual attempts were made to set the blast off, he added: "If there is nothing in the stuff but just dust, I would not be afraid to light the shot with a squib and sit around the rib corner until it goes off." But we are inclined to the belief, that when he saw what happened when the mine did really explode, the old mine boss changed his opinion somewhat.

### How Conditions Have Changed

The main difficulty with which we have to contend, is that many men fail to understand how the nature of the work in the Pittsburg coal has changed from earlier years. The Pittsburg bed, in the portions of the field which were earlier developed, is exposed in extensive crop lines along the banks of many rivers and streams.

Consequently the coal has had an opportunity to lose the gas, naturally contained in it, so that where so exposed it has been robbed of its principal element of danger. The time has come when the deeper developments of the Pittsburg field are made or are being made. The parts now mined and to be mined are many of them 500 ft. below the level of the valleys, and under the higher hills they are at least 1000 ft. deep. Consequently the coal has not had a chance to emit its explosive gases and more care will have to be taken in the newer mines for this reason.

### Old-time Shooting

But there is another danger which does not appear to be generally understood. Where the measures were more shallow, the coal could be dislodged by light shots, but now a very much heavier charge is needed in order to shoot down a cut of coal. It is true that in earlier days, a heavy charge was sometimes used to bring down the thick plate over the top of the coal bed, so that there might be room for hauling where a part of the seam was too thin for working without that provision, but only the lightest of charges were used to bring down the coal.

These roof charges, though heavy, were probably not as great a source of danger as shots in the coal itself. Even when a shot placed in the rock strata failed to work and a "blow-out" resulted, its destructiveness was at the initial point nullified to a great extent by having nothing but rock dust to work in. We have worked in mines in the Pittsburg district where thousands of rooms were commenced and finished without the use of a drill and hence without powder or other explosive.

Consequently we have seen such mines operating day after day with coal dust from an inch to six or eight inches thick lying over every rod of the entry for miles with every projecting ledge and every square yard of surface in the rooms covered with that explosive substance. But nothing untoward happened, or we would not be recording this condition.

It is hard to convince the fire bosses, the foremen, the miners even, who have year after year been as familiar with this dust as a three-year-old boy is with mud, that there is any danger in it. They will strenuously aver that in places where they have worked from boys up, there have been acres and acres of such dust-laden workings, and no efforts whatever were made to remove or dampen it, and no accident happened as a result.

### Present-day Shooting

Of course not, how could anything happen? Coal dust without heavy shooting and without something in the way of a gas or electric combination is certainly innocuous. But in view of the later development in this same field, we shudder to think of the consequences which would possibly have followed a good "solid shot," containing from one to two 5-lb. cans of powder, such as are fired in some of the mines in which we have worked.

Between such mines and a shaft which reaches the deeper and more gaseous portions of the bed, there is a vast difference; the difference existing between the early years of coal dust and no disasters and the years of smaller quantities of dust and disaster. The failure to distinguish properly between the new conditions and the old is a phase of the human element in mining, which has cost dearly in more ways than those specified.

*Pittsburg-Buffalo Coal Co., Marianna, Penn.

## Medical Treatment in Belgium

In Belgium it was found necessary to take a step in paternal legislation in order to rid the mine workers of ankylostomiasis. At first the men who were infected were induced to quit work occasionally for a day in order to receive treatment, but the work done in so short a time was not satisfactory and it was ultimately decided to spread the treatment over a longer and more continuous period. This made it possible to use less violent vermifuges. Wintergreen oil and oil of eucalyptus in most cases then took the place of thymol and extracts of male fern.

While the men were undergoing treatment they received 30c. per day from the provincial funds and usually the coal companies paid 39c. per day additional.

# Coal and Coke News

**From Our Own Representatives in Various Important Mining Centers**

## Washington, D. C.

The Interstate Commerce Commission has rendered an opinion in the case of the Association of Bituminous Coal Operators of Central Pennsylvania versus the Pennsylvania R.R. Co. In this case the complainant attacked the defendant's present rate on bituminous coal from the Clearfield district of Pennsylvania, to South Amboy, N. J. Upon the facts disclosed by the record, it was held that "there has been no unjust discrimination as against the Clearfield operators practiced by the defendant carrier, nor does it appear that the rates attacked are unreasonable."

The opinion is lengthy and includes an historical survey of the situation as to coal rates in the district referred to. Finally the Commission reaches the conclusion that:

It is clearly beyond the power of the Commission to reduce the Clearfield rate upon the ground urged by complainant. It may well be that in times past rates from this and from other fields have been adjusted with relation to the cost of mining coal and that the carriers undertook to make a rate upon which all producers would be brought into competition at common markets and rates so adjusted as to leave to the coal operator a reasonable profit upon his investment. Those rates would fluctuate not with respect to the cost of carriage nor to the value of the service as such, but solely with respect to the needs or advantages of the shippers. Upon the shipper favorably situated in location, and having a thick vein of coal at a slight depth and resulting cheap cost of operation, a higher rate would be imposed than upon his neighbor who might suffer under the disadvantage of a high wage scale and a thin vein. It has been repeatedly said by the Commission that it was not our function, nor that of the carriers, to equalize economic conditions. In this case it fairly appears that the profits made by the Clearfield operators upon tidewater coal are slight, and that if rates should be made so as to sustain an industry which because of intense competition within itself, or because of local disadvantages, yields but a slight profit, the present rate should be reduced. But we do not understand the law as permitting us to fix a reasonable rate solely upon this ground.

### Alaskan Coal for the Navy

Congressman Booker has offered a bill designed to bring about the use of a part of the Alaskan coal supply as fuel for warships. The bill is intended "to provide for a permanent supply of coal for the use of the United States Navy and other governmental purposes, and to provide for the leasing of coal lands in the Territory of Alaska."

The Secretary of the Interior is authorized to "lease to any person above the age of 21 years who is a citizen of the United States, or any association of such persons or any corporation organized under the laws of the United States, any of the lands in the Territory of Alaska to which patent has not been earned or to which equitable rights have not been acquired and which contain deposits of coal or lignite, under such restrictions and upon such terms as in his discretion will best serve to develop the fuel resources of Alaska and which shall protect the interest of the public in such resources. And all such coal lands in Alaska are hereby reserved from entry except as provided in this Act, and except as to other forms of entry not inconsistent with coal leases."

Secretary Meyer recently appeared before the Naval Affairs Committee of the House, and suggested that the government consider a plan to use the Alaskan coal for United States naval vessels on the Pacific. The Booker bill is intended to take cognizance of this suggestion as follows:

The President of the United States is hereby authorized to reserve such tract or tracts of coal lands in the Territory of Alaska as may be deemed sufficient to meet the requirements of the Government of the United States and to provide for the mining of coal in the same for the use of the Navy and Army and for other public purposes: Provided, that if any part of the lands so selected be equitably claimed by any person or persons, under rights of location or otherwise, the Secretary of the Interior is authorized to secure cancellation of such claim by a return to said claimant of the expenses incurred by him on account of such claim, or by giving such claimant a preferential right to a lease upon lands of similar value in some other locality, or by both of such considerations, wherever such negotiations shall fairly determine the rights of the parties and secure to the Government such land as its use may require.

## Alabama

*Birmingham*—About 10,000 acres of coal land, near Warrior, are being developed by the American Coal Corporation. The Louisville & Nashville R.R. is building a branch to the property. An output of from 1500 to 2000 tons a day is contemplated.

It is announced that the Bureau of Mines will reopen its mine rescue station at Birmingham, July 1, with C. H. Brown in charge. At that time instruction in mine rescue work will be resumed. Mr. Brown, who was previously in charge of the station, was called to Pittsburgh on Apr. 1.

## Colorado

*Denver*—The suit of the U. S. Government against the Colorado Fuel & Iron Co. was heard recently in the district court. In this case, the government questions the right of the coal company to hold land, valued at $3,000,000, on which stands its Primero mine, the largest producer and the best paying property of the southern Colorado coal fields. The Colorado Fuel & Iron Co. is seeking by demurrer to prevent the government from asserting title to the land, which it claims was obtained by fraud. The question raised by the C. F. & I. Co. is new in coal-land litigation. It seeks to have the government precluded from asserting title because the company already has had two adjudications by the land-office officials in its favor. The government makes the unique plea that at the time of these land-office hearings it was not able properly to present its case because the facts as to the kind of land involved were concealed and it did not have an opportunity to obtain a hearing on the real merits of the case.

Reports from Louisville and Lafayette show that more or less violence continues to take place in the northern coal fields, consisting chiefly in attacks on nonunion miners by striking members of the miners' union.

## Illinois

*Bloomington*—A fire, which was discovered in the mine of the McLean County Coal Co., near here, May 9, got beyond control, and the workings have been sealed up. Twelve mules were taken out but four perished in the mine. Flames had spread from the second to the third level before being discovered, and it is thought the loss may be heavy. The mine will be closed for a month.

*Princeton*—The mines of the Spring Valley Coal Co., at Seatonville and Dalzell, as well as the mines at Marquette and Ladd, have been opened, but the two mines at Spring Valley will not resume work for perhaps two or three weeks, on account of repairs that are being made. Rumors of an indefinite suspension at the two Spring Valley mines have been denied by the coal company.

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By Sim Reynolds* and W. H. Reynolds

Despite the work of the Bureau of Mines, of the state mine inspectors and of the technical journals, we find a dangerous adherence to old beliefs and a reluctance to accept new light on industrial problems. I recall an old practical miner, who went down to the Bruceton experimental mine. His features bore the inevitable blue stamps of the practical miner, and his knuckles, stiff and calloused, showed how long an acquaintance he had had with actual mining work.

He had been sent to Pittsburg "to see what the Government chaps were up to anyway," and he arrived seemingly determined to accept nothing on faith, nor was he prepared apparently to accept the tests and statements of more scientific men than himself, no matter how conclusive their theories might be—to them. This old mining official had, perhaps, many a time sought a "cap" in his burnished Davy, years before we were efficient to the point where we could open and shut a door on the main haulway. As he ambled about, he convinced us that there still existed, if not among the younger men, at least among many of the old school of mine officials, who are equally charged by the state with the care of many human lives, such a narrowness of mind and viewpoint, as is certain at some time or other to be the cause of a disaster.

In this particular instance, the man had evidently been sent by his employer to witness the demonstration. He passed through the mine previous to the explosion, and at frequent intervals made tests for methane. This not being in evidence, the old man very carefully examined the coal dust lying on the shelves, and even took the additional precaution to gather a handful, placing it in an envelope with deliberation and distrust. This dust he carefully sealed and put away for further examination.

"There may be something in it besides coal dust," said he, doubtfully. And after waiting for the "blow-up," while the first few ineffectual attempts were made to set the blast off, he added: "If there is nothing in the stuff but just dust, I would not be afraid to light the shot with a squib and sit around the rib corner until it goes off." But we are inclined to the belief, that when he saw what happened when the mine did really explode, the old mine boss changed his opinion somewhat.

### How Conditions Have Changed

The main difficulty with which we have to contend, is that many men fail to understand how the nature of the work in the Pittsburg coal has changed from earlier years. The Pittsburg bed, in the portions of the field which were earlier developed, is exposed in extensive crop lines along the banks of many rivers and streams.

Consequently the coal has had an opportunity to lose the gas, naturally contained in it, so that where so exposed it has been robbed of its principal element of danger. The time has come when the deeper developments of the Pittsburg field are made or are being made. The parts now mined and to be mined are many of them 500 ft. below the level of the valleys, and under the higher hills they are at least 1000 ft. deep. Consequently the coal has not had a chance to emit its explosive gases and more care will have to be taken in the newer mines for this reason.

### Old-time Shooting

But there is another danger which does not appear to be generally understood. Where the measures were more shallow, the coal could be dislodged by light shots, but now a very much heavier charge is needed in order to shoot down a cut of coal. It is true that in earlier days, a heavy charge was sometimes used to bring down the thick plate over the top of the coal bed, so that there might be room for hauling where a part of the seam was too thin for working without that provision, but only the lightest of charges were used to bring down the coal.

These roof charges, though heavy, were probably not as great a source of danger as shots in the coal itself. Even when a shot placed in the rock strata failed to work and a "blow-out" resulted, its destructiveness was at the initial point nullified to a great extent by having nothing but rock dust to work in. We have worked in mines in the Pittsburg district where thousands of rooms were commenced and finished without the use of a drill and hence without powder or other explosive.

Consequently we have seen such mines operating day after day with coal dust from an inch to six or eight inches thick lying over every rod of the entry for miles with every projecting ledge and every square yard of surface in the rooms covered with that explosive substance. But nothing untoward happened, or we would not be recording this condition.

It is hard to convince the fire bosses, the foremen, the miners even, who have year after year been as familiar with this dust as a three-year-old boy is with mud, that there is any danger in it. They will strenuously aver that in places where they have worked from boys up, there have been acres and acres of such dust-laden workings, and no efforts whatever were made to remove or dampen it, and no accident happened as a result.

### Present-day Shooting

Of course not, how could anything happen? Coal dust without heavy shooting and without something in the way of a gas or electric combination is certainly innocuous. But in view of the later development in this same field, we shudder to think of the consequences which would possibly have followed a good "solid shot," containing from one to two 5-lb. cans of powder, such as are fired in some of the mines in which we have worked.

Between such mines and a shaft which reaches the deeper and more gaseous portions of the bed, there is a vast difference; the difference existing between the early years of coal dust and no disasters and the years of smaller quantities of dust and disaster. The failure to distinguish properly between the new conditions and the old is a phase of the human element in mining, which has cost dearly in more ways than those specified.

*Pittsburg-Buffalo Coal Co., Marianna, Penn.

## Medical Treatment in Belgium

In Belgium it was found necessary to take a step in paternal legislation in order to rid the mine workers of ankylostomiasis. At first the men who were infected were induced to quit work occasionally for a day in order to receive treatment, but the work done in so short a time was not satisfactory and it was ultimately decided to spread the treatment over a longer and more continuous period. This made it possible to use less violent vermifuges. Wintergreen oil and oil of eucalyptus in most cases then took the place of thymol and extracts of male fern.

While the men were undergoing treatment they received 30c. per day from the provincial funds and usually the coal companies paid 39c. per day additional.

# Coal and Coke News

**From Our Own Representatives in Various Important Mining Centers**

## Washington, D. C.

The Interstate Commerce Commission has rendered an opinion in the case of the Association of Bituminous Coal Operators of Central Pennsylvania versus the Pennsylvania R.R. Co. In this case the complainant attacked the defendant's present rate on bituminous coal from the Clearfield district of Pennsylvania, to South Amboy, N. J. Upon the facts disclosed by the record, it was held that "there has been no unjust discrimination as against the Clearfield operators practiced by the defendant carrier, nor does it appear that the rates attacked are unreasonable."

The opinion is lengthy and includes an historical survey of the situation as to coal rates in the district referred to. Finally the Commission reaches the conclusion that:

> It is clearly beyond the power of the Commission to reduce the Clearfield rate upon the ground urged by complainant. It may well be that in times past rates from this and from other fields have been adjusted with relation to the cost of mining coal and that the carriers undertook to make a rate upon which all producers would be brought into competition at common markets and rates so adjusted as to leave to the coal operator a reasonable profit upon his investment. Those rates would fluctuate not with respect to the cost of carriage nor to the value of the service as such, but solely with respect to the needs or advantages of the shippers. Upon the shipper favorably situated in location, and having a thick vein of coal at a slight depth and resulting cheap cost of operation, a higher rate would be imposed than upon his neighbor who might suffer under the disadvantage of a high wage scale and a thin vein. It has been repeatedly said by the Commission that it was not our function, nor that of the carriers, to equalize economic conditions. In this case it fairly appears that the profits made by the Clearfield operators upon tidewater coal are slight, and that if rates should be made so as to sustain an industry which because of intense competition within itself, or because of local disadvantages, yields but a slight profit, the present rate should be reduced. But we do not understand the law as permitting us to fix a reasonable rate solely upon this ground.

### Alaskan Coal for the Navy

Congressman Booker has offered a bill designed to bring about the use of a part of the Alaskan coal supply as fuel for warships. The bill is intended "to provide for a permanent supply of coal for the use of the United States Navy and other governmental purposes, and to provide for the leasing of coal lands in the Territory of Alaska."

The Secretary of the Interior is authorized to "lease to any person above the age of 21 years who is a citizen of the United States, or any association of such persons or any corporation organized under the laws of the United States, any of the lands in the Territory of Alaska to which patent has not been earned or to which equitable rights have not been acquired and which contain deposits of coal or lignite, under such restrictions and upon such terms as in his discretion will best serve to develop the fuel resources of Alaska and which shall protect the interest of the public in such resources. And all such coal lands in Alaska are hereby reserved from entry except as provided in this Act, and except as to other forms of entry not inconsistent with coal leases."

Secretary Meyer recently appeared before the Naval Affairs Committee of the House, and suggested that the government consider a plan to use the Alaskan coal for United States naval vessels on the Pacific. The Booker bill is intended to take cognizance of this suggestion as follows:

> The President of the United States is hereby authorized to reserve such tract or tracts of coal lands in the Territory of Alaska as may be deemed sufficient to meet the requirements of the Government of the United States and to provide for the mining of coal in the same for the use of the Navy and Army and for other public purposes: Provided, that if any part of the lands so selected be equitably claimed by any person or persons, under rights of location or otherwise, the Secretary of the Interior is authorized to secure cancellation of such claim by a return to said claimant of the expenses incurred by him on account of such claim, or by giving such claimant a preferential right to a lease upon lands of similar value in some other locality, or by both of such considerations, wherever such negotiations shall fairly determine the rights of the parties and secure to the Government such land as its use may require.

## Alabama

*Birmingham*—About 10,000 acres of coal land, near Warrior, are being developed by the American Coal Corporation. The Louisville & Nashville R.R. is building a branch to the property. An output of from 1500 to 2000 tons a day is contemplated.

It is announced that the Bureau of Mines will reopen its mine rescue station at Birmingham, July 1, with C. H. Brown in charge. At that time instruction in mine rescue work will be resumed. Mr. Brown, who was previously in charge of the station, was called to Pittsburgh on Apr. 1.

## Colorado

*Denver*—The suit of the U. S. Government against the Colorado Fuel & Iron Co. was heard recently in the district court. In this case, the government questions the right of the coal company to hold land, valued at $3,000,000, on which stands its Primero mine, the largest producer and the best paying property of the southern Colorado coal fields. The Colorado Fuel & Iron Co. is seeking by demurrer to prevent the government from asserting title to the land, which it claims was obtained by fraud. The question raised by the C. F. & I. Co. is new in coal-land litigation. It seeks to have the government precluded from asserting title because the company already has had two adjudications by the land-office officials in its favor. The government makes the unique plea that at the time of these land-office hearings it was not able properly to present its case because the facts as to the kind of land involved were concealed and it did not have an opportunity to obtain a hearing on the real merits of the case.

Reports from Louisville and Lafayette show that more or less violence continues to take place in the northern coal fields, consisting chiefly in attacks on nonunion miners by striking members of the miners' union.

## Illinois

*Bloomington*—A fire, which was discovered in the mine of the McLean County Coal Co., near here, May 9, got beyond control, and the workings have been sealed up. Twelve mules were taken out but four perished in the mine. Flames had spread from the second to the third level before being discovered, and it is thought the loss may be heavy. The mine will be closed for a month.

*Princeton*—The mines of the Spring Valley Coal Co., at Seatonville and Dalzell, as well as the mines at Marquette and Ladd, have been opened, but the two mines at Spring Valley will not resume work for perhaps two or three weeks, on account of repairs that are being made. Rumors of an indefinite suspension at the two Spring Valley mines have been denied by the coal company.

*Harrisburg*—Mines of the O'Gara and Saline County coal companies in this vicinity have resumed operation, although the outputs so far have been small. The Big Four R.R. has about finished cleaning up the huge pile of coal which it had stored here, amounting in all to some 87,000 tons.

*Waterloo*—St. Louis men have taken options on about 300 acres of coal land, near Millstadt. The seam runs 6 ft. thick, and it is understood that the property will be developed.

*Springfield*—Following the agreement of the miners to return to work, only a few mines in this vicinity resumed operations, and those which did start up employed only about one-half their regular force. Mines of the Lincoln Park, Cora, Jefferson and Chicago-Springfield companies remained closed.

*Kewanee*—Drilling operations, which have been carried on lately east of here, on the property of the Kewanee Coal Co., have proved disappointing, and the project of sinking a shaft will be abandoned. It was hoped to find the Spring Valley seam at least 36 in. thick in this locality, but the last hole disclosed a thickness of only 17 inches.

*Villa Grove*—A 6-ft. seam of coal was struck near here recently by the Douglas Oil & Gas Co., while prospecting for oil. The coal lies at a depth of about 300 ft., and is overlaid by a 26-ft. stratum of slate, promising an excellent roof for mining purposes. It is thought that the oil company will take steps to secure the coal rights on the property.

## Indiana

*Terre Haute*—With practically only one question—that of the weekly pay day—preventing an agreement, the joint wage conference of operators and miners adjourned, after a 3-days session, until May 20. No action has been taken on the six demands set forth by the miners, but according to statements of both operators and miners, the matter of adjusting a contract hinges entirely upon the settlement of the demand for a weekly pay. National officers of the United Mine Workers' organization have expressed the opinion that unless the Indiana miners can prove beyond doubt that their demand for a weekly pay will not increase the cost of producing coal, it is in conflict with the provisions of the Cleveland agreement. An effort is being made to unionize all the men working at the stripping operations in the block-coal field. They number about 500 in all. A meeting of the miners and operators of this district will be called to take action on a wage scale as soon as District 11 has reached an agreement.

*Brazil*—The German Coal Co. and the Bee Ridge Coal Co. have signed an agreement with the miners, acceding to the demands made by the miners' union, and have resumed operation. Neither of the mines employs many men and most of their output is used by local consumers.

## Iowa

*Des Moines*—A tentative wage-scale agreement was submitted by the subcommittee to the general committee of operators and miners, which reconvened here, May 14. It was understood that all points in dispute had been satisfactorily covered.

*Perry*—An extensive new coal field will be opened up for development a few miles south and east of this city during the summer. The seam is several feet in thickness and of a superior quality. It is thought by miners that the new field is a part of the seam which crops out at Ogden and points further north, and not a part of the field now operated in this county, near Madrid.

*Dallas*—Development work on the Indiana Consolidated Coal Co.'s shaft, in Dallas Township, was resumed recently. The combination air shaft and manway will extend to a depth of 65 ft. Work on the new Rock Island road, in the southeastern part of Marion County, known as the Carlisle-Allerton cutoff, is being pushed with all possible speed. That portion of the line near the Indiana Consolidated Coal Co.'s mine is practically finished.

## Kentucky

*Louisville*—Coal operators in Kentucky are keenly interested in the improvement of transportation facilities which will enable them to get into central freight association territory more easily and are following closely all new work of the railroads. That preparations are being made to render better service is evidenced by the completion of the Kentucky & Indiana bridge at Louisville; the prospective construction of a bridge near Paducah, by the Burlington and other lines; the rebuilding of the Pennsylvania bridge at Louisville, operated by the Louisville Bridge Co.; the construction of a bridge by the Owensboro & Rockport Bridge & Terminal Co., which has given notice of its plans for building at a point between Owensboro, Ky. and Rockport, Ind.; and the reconstruction of the bridge of the Norfolk & Western near Kenova, W. Va.

W. C. Black and Jesse Turner have leased a coal property on Straight Creek, in Bell County, and will put it in operation at once. They have announced that the capacity of the mining plant will be considerably enlarged.

Boxley & Co. have begun the construction of a 20-mile section of the Williamson & Pond Creek R.R., the contract for which was recently awarded them. A number of subcontracts for grading and tunneling have been let, and a big force of men has been put in the field. Meanwhile the Pond Creek Coal Co. is pushing development work on its coal property.

*Pineville, Ky.*—The Continental Coal Corporation, which was formed a year ago for the purpose of taking over a number of operating companies in the Straight Creek district of eastern Kentucky and Tennessee, recently gave a banquet here to the employees of its operating and commissary departments, celebrating the first anniversary of the company's organization. Fifty-six were present. White L. Moss, vice-president and general manager of the company, was toastmaster.

*Barbourville*—The Knox County Coal Co., which was recently organized with $250,000 capital stock, will have its chief offices in Lexington, and will proceed with the development of coal lands in Knox County.

## Ohio

*Columbus*—Attorneys for the New Pittsburg Coal Co., operating mines at Nelsonville, along the line of the Hocking Valley R.R., appeared before the Interstate Commerce Commission May 15, in an effort to obtain a readjustment of rates to Lake Erie ports. The present rate is 75c. and the company is contending for a reduction of 30c. per ton. It is alleged that transportation costs of the railroad company do not exceed 40c. per ton, and that 37c. is a fair average. The commission made an exhaustive examination of the case and an early decision is expected.

After a ten-days session the joint conference of operators and miners of the Hocking sub-district, the basing territory for Ohio, adjourned May 15, having reached a complete agreement. The contract which has been signed, consists of 35 sections. It goes into every detail of the working conditions and will have an important bearing on the settlements reached throughout the various mining fields of the state.

*Bridgeport*—A deal was closed here May 16 whereby the Woodsfield Coal Co., of Fairmont, W. Va., purchased from W. R. Hawkins and R. L. Hoskinson, of Waynesburg, Penn., 4600 acres of coal land in Monroe County. The deal involves $200,000.

Two men were injured, one probably fatally, when a 20-ton electric locomotive at the Wheeling Creek mine of the Lorain Coal & Dock Co. went down a 20-ft. embankment, near here, in the morning of May 17. The motor was buried in several feet of mud, one of the victims being pinioned under the frame.

*East Liverpool*—The Quaker Valley mines at Rogers have been sold to the Mullins Coal Co. and the mines which have been idle for some time will now be operated to capacity. The Mullins

company has other holdings at East Palestine, New Waterford and New Philadelphia.

## Pennsylvania

BITUMINOUS

*Greensburg*—The Loyalhanna Coal & Coke Co., operating mines in Derry Township, recently filed a suit against Michael Hines, James Quinn and Columbus Johnston for $150,000 damages. The plaintiff in its statement charges that the defendants own a tract of coal adjoining its tract of 1000 acres in the Pittsburg seam. During the last six years, the plaintiff alleges, the defendants have gone over their line and mined a large block of coal belonging to the plaintiff. Under the act of 1876 treble the value of the coal taken is asked.

*Pittsburg*—The Interstate Commerce Commission recently dismissed the complaint of the Association of Bituminous Coal Operators of the central Pennsylvania district against the Pennsylvania R.R. Co., holding that there exists no discrimination against the operators in the Clearfield district of Pennsylvania, and holding to be reasonable the existing rates on bituminous coal to South Amboy, N. J. The complainant alleged that the present rate of $1.55 per gross ton was unjustly discriminatory in favor of the Latrobe and Greensburg districts, which have a rate of $1.65. It was sought to have the rate reduced to $1.44.

*Butler*—Declaring that the new scale demanded by the miners cannot be paid without operating the mines at a loss, the Great Lakes Coal Co., of Pittsburg, owning four mines at Kaylor, has announced an indefinite suspension. Five hundred men are thrown out of work. The mines have been prepared for a shutdown for the past year.

*Boswell*—The Atlantic Coal Co., with operations near here, has recently acquired a tract of 1500 acres of coal land in Brothersvalley, Black and Summit townships. This adjoins another tract owned by the company, consisting of about 500 acres. These tracts are underlain with the B seam of coal which here runs from 6½ to 9 ft. in thickness. It is understood that the Atlantic company will commence operations here at an early date, building a plant of 1200 to 1500 tons daily capacity along a spur of the B. & O. R.R.

*Connellsville*—Connellsville coke production and shipments remain stationary at 400,000 tons and 12,000 cars weekly, chiefly because there is a persistent deficiency in the labor supply in spite of the fact that the region pays the best wages in the world. The furnace interests recently blew out 1530 ovens and fired 60, making a net decrease of 1470. Independent operators seem to be well supplied with orders.

The little Junction plant of the Marietta-Ganier Coke Co., at Broadford, idle since April, 1910, was fired up lately.

ANTHRACITE

*Scranton*—One man was killed, two seriously and one slightly injured at midnight, May 16, when a slide of rock occurred near the Consolidated colliery of the Hillside Coal & Iron Co., in Moosic, where a 30-ft. cut was being made in fighting a mine fire.

The court recently handed down orders appointing mine inspectors' examiners and miners' examiners. W. L. Allen and Leon Whaite, mining engineers; and Patrick Flannelly, James Strong and John Bartosch, miners, were reappointed examiners of applicants for mine inspector.

The city council has passed a resolution authorizing the city solicitor to frame an ordinance whereby it is hoped that the streets of Scranton may be protected against damage by cave-ins. The resolution is now in the hands of the mayor.

The Bradley washery in South Scranton was destroyed by fire Saturday evening, May 18. The fire is supposed to have been caused by defective insulation of the electric wiring. The washery had not been in operation since Apr. 1. The loss will reach $25,000, of which amount about three-fifths was covered by insurance.

*Wilkes-Barre*—The tri-district convention of anthracite mine workers, which met here May 14, after a four days' session, voted on May 18 to accept the tentative wage scale agreement which was reached by the subcommittee of operators and miners on Apr. 25. The vote was 323 to 64 in favor of acceptance. There was at first much opposition offered to a ratification of these terms but President White and the more conservative element, in the end, easily dominated the convention. At a meeting in Philadelphia on May 20, representatives of the operators and miners signed the new agreement.

*Mauch Chunk*—The Anthracite Drifted Coal Co. has been organized by J. G. Reber and G. A. Alleman of Shoemakersville to recover the fine coal which has been washed down the Lehigh River and has collected above the dams at Parryville, Lehigh Gap and Three Mile Level, near Easton. Arrangements have been made with the Lehigh Coal & Navigation Co. permitting this work to be carried on.

## Rhode Island

*Providence*—The mines and property of the Rhode Island Coal Co. at Portsmouth were sold at auction, May 17, by order of the U. S. District Court. All property of every kind owned by the corporation was sold excepting the mined coal in the yards at Newport. The real estate comprises a tract of 2446 acres and the whole property carries a mortgage of $100,000.

## Washington

*Chehalis*—It is stated that P. C. Cockerill and other men of Sioux City, Iowa, whom he represents, will probably buy the coal mine at Littell which is owned by W. A. Conniff. Mr. Cockerill states that he has a market for all the coal that could be mined on the property.

## West Virginia

*Wheeling*—Miners of the fifth Ohio subdistrict opened their convention here May 13 with 96 delegates present from 104 local unions representing 17,000 men. They appointed a scale committee, to report to the convention, and met the operators May 15. The Cleveland scale was used as a basis of settlement, but many questions relating to "deadwork," "sticky bottoms" and outside day work threatened to make trouble.

*Bluefield*—The Tierney Coal Co., which was recently incorporated in this state, is a holding company which owns some 11,000 acres of coal land in Pike County, Ky. This will be divided up and leased to operating companies. The property is underlaid by the Freeburn and Thacker seams and is located on the west side of Pond Creek. It will be served by the new line of the Norfolk & Western R.R., which is to be extended into that territory from Williamson and it is expected that construction work on this road will be started within the next few weeks.

*Charleston*—Despite the fact that one-half the mines in the Kanawha district were idle during the month of April, the coal output for that month passed all previous records, totaling 1,864,220 tons.

Fifteen hundred miners are on strike in the Paint Creek section.

*Fairmont*—Caving of the old Commercial mine on Coal Run recently caused a considerable subsidence of the surface and damaged property in the neighborhood. After an examination of the mine, further trouble was thought to be unlikely.

## Canada

*Regina, Sask.*—Word was received from England, May 13, that J. H. Haslam had completed the formation of a $5,000,000 company with British capital for the exploitation of the Estavan coal fields. It is understood that Viscount Haldane and Winston Churchill have been named as directors of the new concern.

*Ottawa, Ont.*—William Ross, minister of mines and forests in British Columbia, recently interviewed Premier Borden in regard to the law compelling all railways in British Columbia to use oil for fuel after December 1914. Mr. Ross protested that this would be a great blow to the coal industry and urged that in an effort to protect the forests, the new provincial system of forestry patrol be given a trial rather than the compulsory use of oil.

## Personals

F. E. Zerbey, general manager of the Kingston Coal Co., is recovering from an operation for a severe attack of appendicitis.

W. A. Ogg, comptroller of the Island Creek Coal Co., visited Duluth recently on business, and inspected the company's new dock, under construction at that point.

Harry E. Loomis, vice-president and general manager of the National Coal Co., of Cleveland, Ohio, recently sustained a fractured skull, as the result of a fall, while in Baltimore, Md.

H. J. Schmitt, assistant superintendent of the safety department of the Tennessee Coal, Iron & R.R. Co., has been made manager of a southern bureau of industrial safety, which he organized.

L. F. Card has been chosen superintendent of the Mine Foremen's Association, recently organized at Knoxville, Tenn. Kentucky, West Virginia, Virginia and Tennessee are represented in the organization.

Thomas R. Jones, formerly inside district superintendent, Lehigh division of the Lehigh Valley Coal Co., has been appointed inside superintendent of the Lehigh division and Coxe collieries, effective May 15.

Arthur Lewis, formerly district superintendent, Lehigh division of the Lehigh Valley Coal Co., has been appointed division engineer of the Lehigh division and Coxe collieries, with headquarters at Hazleton, Penn., as heretofore.

Benjamin W. Robinson, of Madisonville, Ky., a well known operator and formerly general manager of the St. Bernard Mining Co., suffered the loss of his home at Knot Lick, Mo., as the result of the tornado which passed that way recently.

Alexander Sharp, of Vancouver, B. C., mining engineer for P. Burns and associates, will shortly proceed to Alberta, to spend the summer in developing the Burns' coal mines, situated in the eastern foothills of the Rocky Mountains, southwest of Calgary.

Dr. J. J. Rutledge, of the Federal Bureau of Mines, has been spending a few days in Alabama, inspecting the mines and devoting considerable attention to investigating the working of gasoline locomotives, a number of which have recently been installed in Alabama.

George T. Robinson, superintendent of mines for the Cambria Steel Co., has tendered his resignation, to take effect at the end of the present month. He leaves to look after his personal interests in a number of coal companies and coal properties. Mr. Robinson has been with the Cambria company for the past 21 years, 11 years as superintendent of coal mines.

## Construction News

Butler, Penn.—Thomas Lochrie has asked for bids on 12 new miners' houses at Argentine.

Dunlo, Penn.—The Mountain Coal Co. is installing an electric power plant at its local operation.

Wallins, Ky.—The Terry's Fork Coal Co. is installing electrical equipment and will operate its machinery with motor drives.

Milwaukee, Wis.—The C. Reiss Coal Co. is building a large new dock at Green Bay and will install coal-handling equipment and machinery.

Birmingham, Ala.—The Little Cahaba Coal Mining Co. will install an electric-power plant and equipment at its mines at Piper and Coleander.

The Sloss-Sheffield Steel & Iron Co. has placed orders for boilers and equipment aggregating $35,000.

Joliet, Ill.—The L. M. Rubens Coal & Transfer Co. will build a coal-storage yard of 5000 tons capacity, along the Chicago & Alton tracks.

Madisonville, Ky.—It is reported that Isaac and Bernard Bernheim will develop the coal property here, recently purchased from William Harris.

Durant, Okla.—A large central electric plant will be built at the coal mines 10 miles from here, to furnish power to Fort Worth, Dallas, Little Rock and vicinity.

Erie, Penn.—It is reported that plans are being made for the addition of another large coal-handling rig at the Susquehanna coal docks of the Pennsylvania R.R.

Clarksburg, W. Va.—The Maryland Coal Co. has awarded a contract for grading and laying tracks at its new mining property at Wendell, to C. P. Keeley & Co.

Mt. Sterling, Ky.—The Eastern Kentucky Land Co. has sent out inquiries for prices on equipment with a view to the development of coal land near Cumberland Gap, Tenn.

Brownsville, Penn.—Contract for a concrete lined slope and other construction work at the Lilley Coal & Coke Co.'s new mine has been awarded to the Drake-Stratton Co., of Pittsburg.

Ashland, Ky.—The Kentucky Solvay Coke Co., which was recently incorporated with a capital of $650,000, expects to spend $500,000 on the construction of its new coke ovens and byproduct plant at Ashland.

Warrior, Ala.—The American Coal Corporation, Belton Gilreath, president, is developing 10,000 acres of coal land for a daily output of 1500 to 2000 tons. It is reported that from $350,000 to $500,000 will be spent on improvements.

Louisville, Ky.—The Harlan Coal Mining Co. has awarded contracts as follows: Power plant and electric mining machine equipment, to the Morgan Gardner Co., Chicago; conveying machinery, to the Jeffrey Mfg. Co., Columbus, and boilers, to the Skinner Mfg. Co., Pittsburgh.

Barbourville, Ky.—The Harlan Coal Mining Co., recently incorporated, is perfecting arrangements for the development of 10,000 acres of coal lands. The land will be subdivided and leased. It is reported that eight or ten separate mining plants will be installed this summer. These will be electrically equipped.

## Publications Received

INVESTIGATIONS OF EXPLOSIVES USED IN COAL MINES. By Clarence Hall, W. O. Snelling and S. P. Howell. Bulletin No. 15, U. S. Bureau of Mines. 196 pages, 6x9 in., illustrated.

The bulletin describes the method used in testing explosives, and defines what a permissible explosive is. On this subject, W. O. Snelling says: "The underlying causes for one explosive being safer than another in the presence of explosive mixtures of gas or coal dust have been investigated during the past few years. The many thousands of lives lost in coal-mine disasters have shown the necessity of such investigations, and have stimulated to a marked extent researches in regard to the preparation of explosives suitable for use in coal mining. It has been found that every known explosive, if fired in a sufficiently large charge, will cause the ignition of an explosive gas mixture, but explosives have been found to differ widely in regard to the amount that can be fired without causing such ignition. Ordinary black blasting powder, for example, will cause the ignition of explosive gas mixtures very readily, as little as 25 grams invariably serving to bring about this result. Certain other explosives, in quantities as great as 1000 grams, after repeated trials, under conditions exactly similar to those used in testing black powder, have invariably failed to cause ignition of the explosive gas mixtures."

## Trade Catalogs

National Foundry & Machine Co., Louisville, Ky. Catalog No. 12. Reilly Steam Pumps and Air Compressors. 160 pp., 5¼x7¾ in., illus.

Shear-Klean Grate Co., Chicago, Ill. Booklet "Save Coal," descriptive of a new shaking grate, recently placed on the market. 12 pp., 4x9¼ in., illus.

The Goulds Manufacturing Co., Seneca Falls, N. Y. Bulletin No. 112. "Handy Data on Power Pumping." 16 pp., 7½x10 in., illus. Contains a compilation of the data required for figuring on the usual pumping installations for various purposes with special reference to belt or gear driven pumps.

## Industrial

The executive offices and New York show rooms of the H. W. Johns-Manville Co., manufacturers of asbestos, magnesia and electrical supplies, were moved June 20, to the new 12-story H. W. Johns-Manville Building, Madison Avenue and Forty-first St., New York City, from their old quarters at 100 William St., where they have been located for the past 15 years.

Increased business interests in this and other parts of the country have necessitated the move. The large floor area and spacious rooms in the new building, will enable a much larger and more complete stock of goods being carried on hand than heretofore, and will also permit of a better supervision over the company's long chain of branch offices, warehouses, stores and factories scattered throughout the United States and Canada.

# Coal Trade Reviews

**Current Prices of Coal and Coke and Market Conditions in the Important Centers**

## General Review

The conclusion of the anthracite strike is viewed with general satisfaction in trade circles. Even though prices ease off and the market settles down into the customary summer dullness, all uncertainty has, at any rate, been removed and normal conditions will soon prevail again. Anthracite dealers will try to lay in as much low-priced summer coal as possible, and the season's trade promises to be very active.

The consumers are impatiently waiting the announcement of the new anthracite circular, and it seems there may be some trouble in fixing a satisfactory scale of prices. The steam quotations cannot be increased because of the competition with bituminous, while an advance in egg would tend to shift the demand for this grade to stove and chestnut. This apparently only leaves three sizes, representing less than half the anthracite production, upon which the increased cost of mining can be made up.

The present outlook in bituminous is not encouraging. There has been an almost continuous heavy production since the first of the year, and with all hopes of profiting by the anthracite suspension now gone, only a rigid curtailment at the mines can prevent a repetition of last season's low prices. The Eastern movement is confined almost entirely to contracts, and prices are easy, with very little new business being done.

The demand at Pittsburgh is light, with the mines working about 50 per cent. capacity, chiefly on Lake orders. In Ohio the trade is proving a decided disappointment, although there is as yet no attempt to force the market by price-cutting. There is very little of the customary early summer stocking of domestic, but a fairly strong demand for screenings is in evidence.

In the South the market is in a very satisfactory condition, due to a renewed activity at the blast furnaces, which has taken this grade of coal out of the commercial market. Larger tonnages are moving in the West, and the demand is slightly improved.

## Boston, Mass.

Some of the bituminous shippers are freely predicting a repetition of last year, and the feeble hopes built on the anthracite strike prospects have now vanished. Only a rigid curtailment and strong control on the part of operators can prevent another season of small returns. The months January to May saw a heavy movement, particularly from the West Virginia districts, and it will be hard to put production back to an off-year basis. The export market, from which much was expected, is also falling off for the present. The trade in general is beginning to realize that stocks are large and that without special inducements the demand will be light for months to come.

The all-rail trade is gradually recovering from the effects of the March "flurry," and will soon be on the usual basis. For summer months certain of the mines are offering at last year's contract prices, but buying is only from hand to mouth.

Georges Creek shipments have been heavier than usual. These shippers were the first to announce contract prices and have reaped benefit also from the anthracite barges they were in position to use. An increasing differential between their price and that on Pocahontas and New River will tend to offset the advantage they have enjoyed so far this season.

The settlement in anthracite will be welcomed in New England. With the suspense over, dealers will now plan spring shipments and get forward as much of this low-priced coal as they can store. A strong demand and a slow shipping season are looked for through the summer, and dealers are anxious to hear what the opening prices will be. There have been rumors that one of the anthracite companies that has always been prominent in the tidewater trade is to withdraw, in order to concentrate along the line and in the West.

Current wholesale prices are about as follows:

| | |
|---|---|
| Clearfields, f.o.b. mine | $1.10@1.35 |
| Clearfields, f.o.b. Philadelphia | 2.35@2.60 |
| Georges Creek, f.o.b. Baltimore | 2.70@2.80 |
| Pocahontas, New River, f.o.b. Hampton Roads | 2.70 or less |
| Pocahontas, New River, f.o.b. cars Boston | 3.60@3.70 |
| Pocahontas, New River, f.o.b. cars Providence | 3.45@3.50 |

## New York

*Anthracite*—The final agreement between the anthracite miners and operators has caused a decided flurry in the hard-coal market here. Preparations are being made to handle heavy tonnages when the mines get under full operation again, and consumers are anxiously awaiting the announcement of the new circular. The large operating companies are now fixing the new scale, which will doubtless show an appreciable increase over the one now in effect.

The hard-coal trade is in a strong position, and the season's shipments will probably see some new records established here. Supplies are down to an unusually low point, and there is considerable doubt expressed as to the ability of the mines to catch up before fall.

Pending the announcement of the new schedule we continue to quote prevailing prices at the old circular as follows:

| | |
|---|---|
| Broken | $4.50 |
| Egg and stove | 5.00 |
| Chestnut | 5.25 |
| Pea | 3.25 |
| Buckwheat | 2.75 |
| Rice | 2.25 |
| Barley | 1.75 |

*Bituminous*—The bituminous market has settled down into the usual summer dullness, and it is thought the next two months will see a relapse in this trade. The large wholesalers, however, maintain optimistic views for the future, and believe that conditions are about normal for this period. Bituminous has undoubtedly been sustained to some extent by the uncertainty in the hard-coal situation, and with this feature eliminated the market will probably weaken.

Spot bituminous prices, f.o.b. New York, are about as follows:

| | |
|---|---|
| West Virginia steam | $2.35 |
| Ordinary grades Pennsylvania | 2.45 |
| Fair grades, Pennsylvania | 2.55@2.65 |
| Good grades, Pennsylvania | 2.70@2.80 |
| Best Miller, Pennsylvania | 3.00 |
| Georges Creek, West Virginia | 3.15 |

## Pittsburgh, Penn.

*Bituminous*—Demand for coal continues slack in the local market. Mines are now running at better than 50 per cent. of capacity, but chiefly on Lake coal, the movement in which has now assumed fair proportions. The expectation continues that this will prove to be the banner year in Lake shipments. Prices in the local market have not been well tested, and the quotations announced at the opening of the mines may still be quoted as nominally the market: Mine-run, $1.22½; ¾-in., $1.32½; 1¼-in., $1.47½; slack, 82½c., per ton at mine, Pittsburgh district.

*Connellsville Coke*—Contracting for furnace coke for the second half of the year has definitely begun, two contracts being announced in the past few days, one 10,000 tons monthly at $2.35 and one for 6000 tons monthly at $2.40. Several weeks ago, a contract for 10,000 tons monthly was made at $2.35. Many of the operators have set $2.50 as their objective point, but furnaces will not pay

this price without a struggle. The merchant furnaces, as a rule, cannot afford to do so, on account of the low price of pig iron.

The prompt market has eased off in the past two or three days, and prompt furnace coke can now be secured without difficulty at $2.25, against $2.40 freely paid a week ago. The $2.25 price has even been shaded today. We now quote: Prompt furnace, $2.25; contract furnace, $2.35@2.40; prompt foundry, $2.75; contract foundry, $2.75.

The *Courier* reports production in the Connellsville and lower Connellsville region, in the week ending May 11, at 401,960 tons, an increase of 116 tons, and shipments at 4331 cars to Pittsburgh, 6339 cars to points west and 1321 cars to points east, a total of 11,911 cars, an increase of 62 cars.

## Philadelphia, Penn.

The long, expensive suspension in anthracite is now at an end, and probably the public will be asked to pay the bill. Much speculation is rife as to what the probable prices will be. With a market practicaly bare of coal, there will probably be no concession in prices made, the operators depending upon this fact to dispose of their output. If the latter arrangement is followed out, and the trade remains indifferent, the coal, in all probability, will be placed in stock, to provide for the tremendous demand that will come in the fall. It is almost a foregone conclusion that there will be an advance in the prices of some of the sizes —probably stove and pea—if not now, then later on in the fall. When it is remembered that the steam prices have to remain at their present level, in order to meet the competition of the bituminous coals, and cannot, therefore, be burdened with any of the increased cost of mining, and that any advance in the price of egg is likely to shift the demand for this size to stove and chestnut, it leaves little to bear the burden of the increased cost of production but the three intervening sizes, representing only 40 to 45 per cent. of the output.

Reports from the mines indicate that it will be a month before the collieries will be operating on anything like a normal basis. The opportunity afforded by the suspension led many of the foreign element to take advantage of the idleness for a trip to their homes in other countries, while others have gone to the bituminous fields. Most of the latter will soon return to the anthracite mines, and the former, as soon as they are aware that peace is assured.

The bituminous trade seemed to have profited little by the suspension in the anthracite region. One operator said that he had not had such a dull period for many years, and might be compelled to close down his plant. Many bituminous operators have been turning down contracts, in the hope of reaching more benefits through a continued strike in the anthracite, but the prices of 1902 saw no duplication in the 1912 difficulty.

## Baltimore, Md.

While coal moved with regularity at all of the railroad piers in Baltimore throughout the week, there was a hesitancy on the part of shippers to forward their product through this port for fear there might be a renewal of the strike. Consequently, the local market was not very active, especially so far as spot business was concerned. Consumers desiring immediate deliveries were as timid as the operators, and took no chances of having it held up at this port.

Practically all of the shipments handled at the piers here during the week were moving under contract, and, to the credit of the railroads, operators have not had much to complain about in the movement. The stevedore strike is still in progress, and many laborers are being intimidated, but the railroads have done everything possible to get their full quota of men at the piers, and they have succeeded in doing quite well; they have their full complement of men at work, and expect no further trouble.

Inquiries at the offices of the local operators shows that very little new business is being booked at this time. Prices are easy, and it was stated by one operator that the low grades could be purchased for 65@70c. per ton, with the next best at $1@1.10 per ton. The big vein Georges Creek coal is now bringing between $1.60 and $1.70 per ton.

The coke market is gradually improving. Inquiries are increasing, and some business is being closed; the improvement in the steel trade is responsible for this.

## Buffalo, N. Y.

There is not much activity in the bituminous market yet, but here and there a consumer is running short, and the demand will increase slowly from this time on. Prices are not strong, though it is claimed they are firmer than in the East, especially in New England. This section suffers from an excess of production, but not to the extent the West Virginia markets do.

There is practically no anthracite moving, though if anyone is in great need of a little it can generally be obtained. There has been no complaint from the consumers in that trade and would hardly be any till it is time to stock up in September. There is all manner of speculation as to the price that will be asked when the supply returns, the general belief being that higher prices will be asked.

Some members of the bituminous trade claim to be getting full prices, and say that the very low quotations reported are for inferior grades or small amounts that are in danger of incurring car service. Prices are not very strong, however, at the following regular figures: Pittsburg three-quarter, $2.57½; mine-run, $2.47½; slack, $2.25. Coke is not strong, but is fairly active at $4.50 for best Connellsville foundry. Stock coke is stronger than the higher grades.

There is a fair amount of contracting for bituminous, some believing that the usual tonnage is already placed, though at the beginning of the season neither buyer nor seller was anxious to contract. There is not much difference in price, either for immediate consumption or on contract, from last year, so that the bituminous trade is not getting on its feet very rapidly yet. Profits will continue to be small.

There is no coal traffic from here by Lake yet, and it will be some time after the mines are active before there will be much anthracite for shipment. Much effort will be made to catch up with last season when the start is made, but it is doubtful if it can be done, as the Eastern demand will be heavy.

## Cleveland, Ohio

Very little improvement, if any, has taken place during the past week in this market, owing to the general dullness in the trade and the large amount of coal that manufacturers stored prior to the suspension. A great deal of this coal is still on hand and manufacturers are loath to stock up further until they see prospects of a business revival and this is making the trade slow.

A number of mines have started up in the past two weeks, due principally to the opening of the Lake trade. It is reported by some operators that difficulty is experienced in procuring sufficient men to work in the mines.

The greatest demand is for the fine sizes. There seems to be quite a shortage of that grade, owing to the mines not running full. Prices are: No. 8, $1.55@1.60; No. 6, $1.45@1.50; Pittsburg gas slack, $1.55@1.60. A small quantity of coarse coal came to this market during the past week, and there has been great difficulty in disposing of it at a fair price.

The increased cost of mining is a this situation rather discouraging to the operator. However, this condition is looked upon as only temporary, as soon as Lake shipments start, which will be about June 1, the demand will resume its normal activity.

Very few contracts have yet been made, which is contrary to the usual custom in the past. Manufacturers prefer taking chances in the open market. Many domestic dealers are also holding off this year, a condition which has never existed in the past.

## Columbus, Ohio

The May coal trade is proving a disappointment in all branches, with the exception of the Lake movement. It is found that both steam consumers and retail dealers are stocked far beyond normal for this period of the year. In the case of the steam trade, heavy tonnages were taken on in March, sufficient to run plants, in many instances for several months to come. This is particularly true of the mine-run grade.

The fine-coal market is being stimulated by idleness at mines in Indiana, where district conditions have not yet been settled. This has caused an advance in price of 10c. a ton on nut, pea and slack, and jobbers are readily buying up every car of these grades available.

It is in the early domestic stocking trade that the dullness is most marked, as May usually sees these grades sold up well into the summer. The present condition is explained by the fact that a very large tonnage of high-priced coal was shipped from the mines during the extreme cold weather in the early part of the year. As a result, dealers are now lacking yard room for stocking splint, smokeless and other grades, which they usually put in early.

Slow delivery has been hard on shippers, as bills are not usually paid under 30 days from time cars arrive at destination. Many operators are giving more thought to their collections than to new business. No attempt appears to be made at forcing the market by price cutting, and there is hope of a prosperous domestic business later in the summer.

## Birmingham, Ala.

The coal market of Alabama retains its strength and is tiding over the dullest part of the year in very satisfactory manner. Dealers have been prosecuting a vigorous campaign for business and have to their credit, orders which heretofore have not come to the Birmingham district. The contracting for steam coal is opening with very satisfactory outlook and June and July will witness several important orders rounded into contracts at good figures.

Just now iron is buoyant and promising. Furnace companies are not actively seeking markets for their surplus coal, as was the case a few months ago. All of the iron companies are figuring on increasing their furnace capacity and the indications are that they will prefer to store coal rather than push it into the open market as a labor shortage seems probable in the coal fields.

It also seems certain that more commercial coal will be mined this year than any previous year if the present rate keeps up. The output is being taken care of in new markets west of the Mississippi River, by increased bunkerage at New Orleans, Mobile and Pensacola, by railroads not hitherto using Alabama coal and by making some gain in the fiercely competitive fields of Georgia.

Commercial coke producers report an active market with abundance of orders at favorable prices. The situation at the more northern furnaces has tended to assist in keeping Alabama coke firm at present prices. In the coke market as in the coal, the furnace requirements ease competition in the open market and the year promises to show a gradual improvement on this account.

## Indianapolis

There is little or no change in the situation in this state. Both operators and miners are greatly disappointed because mining has not been resumed, and much interest is manifested in the action of the joint conference now in session at Terre Haute.

Orders are piling up with the operators which they are unable to fill. It is not pleasing or encouraging for them to see their customers going to other fields to obtain coal. The Lake trade continues to order Indiana coal, but without avail. Domestic consumers and manufacturers have borrowed coal, much of it from the railroads, to keep their plants going, but even this source is beginning to show such a diminution as to look decidedly ominous.

Those who prophesied that the Indiana mines would resume operation more than a week ago are again as confident that they will be at work before the close of another week. The weekly pay remains the only difference in the way. The operators declare that a weekly pay will increase the cost of construction in violation of the Cleveland agreement, and the miners' officers admit that it is up to the miners to prove that it will not.

## St. Louis, Mo.

There is a slightly larger tonnage coming into the St. Louis market, and the demand has increased some over last week. However, the incoming tonnage has exceeded the demand, and this has resulted in a cutting of prices.

The contract for the schools of St. Louis went to the Devoy & Kuhn Coal & Coke Co., at $1.82 delivered for screened lump coal from the Belleville or Standard district. The other city contract, calling for 4000 tons of No. 4 washed coal, went to the Southern Coal & Mining Co. at $1.90 delivered. The rate on this coal is 52c. as well as on Donk Bros., who were the next lowest at $1.92 delivered.

There are a few other contracts of a like nature that are still hanging fire, but it is hard to prophesy as to what they will go at. On Carterville district coal contracts have been let as low as $1.05 at the mine on mine-run, 75c. on screenings, $1.25 on nut and $1.35 on everything above two inches. It is understood that the railroad mine-run contracts this year will be in the neighborhood of $1.12.

There is very little demand for coke, and practically nothing doing in the smokeless line right now.

The market opened the early part of the week as follows:

| | |
|---|---|
| *Williamson and Franklin County* | |
| 6-in. lump | $1.30@1.40 |
| 3x6 egg | 1.30@1.40 |
| 2x3 nut | 1.25@1.35 |
| 2-in. screenings | 1.05@1.15 |
| Mine-run | 1.05@1.15 |
| *Mount Olive* | |
| 3-in. lump | $1.25 |
| Nut | 1.25 |
| Screenings | 1.10@1.15 |
| Mine-run | 1.10@1.15 |
| *Standard* | |
| 6-in. lump | $1.00@1.05 |
| 2-in. lump | 0.95@1.00 |
| 2-in. screenings | 0.95@1.00 |
| Mine-run | 0.90@0.90 |

## Chicago

Within the last week a slight improvement has been noted in the Illinois coal market. Small orders have appeared here and there for domestic lump.

A resumption of cold weather has caused a steady consumption of coal which has led to a small amount of buying from the retailers. Springfield lump continues at $1.50 and steam lump remains firm at $1.25. Southern Illinois steam coals are a little higher, as a result of a boost in freight rates. Reports indicate that mines in the Hocking Valley district are running at about full time; a small part of this coal is reaching Chicago. The Chicago price has not been changed, being $1.50 at the mines, or $3.15 f.o.b. Chicago.

There are some inquiries for coke contracts. Spot business is fairly good and prices are steady to firm.

Prevailing prices at Chicago are:

| | |
|---|---|
| *Sullivan County* | |
| Domestic lump | $2.37 |
| Egg | 2.12 |
| Steam lump | 2.02 |
| Screenings | 2.02 |
| *Springfield* | |
| Domestic lump | $2.32 |
| Steam lump | 2.07 |
| Mine-run | 1.97 |
| Screenings | 1.97 |
| *Clinton* | |
| Domestic lump | $2.27 |
| Steam lump | 2.02 |
| Mine-run | 1.92 |
| Screenings | 1.92 |
| *Pocahontas and New River* | |
| Mine-run | $3.15 |
| Lump and egg | 3.30@3.55 |

*Coke*—Prices asked for coke are: Connellsville and Wise County, $4.75; byproduct, egg and stove, $4.55; byproduct, nut, $4.55; gas-house, $4.75.

## Portland, Ore.

Portland and all of Oregon are already in the midst of warm summer weather and there is little business for the coal man these days. Storage rates have not yet been announced but if the warm weather continues, the dollar will soon

be lopped off quotations to those who are willing to stock up when business is dull. There is considerable agitation here to have the railroads extend lines into the coal fields of eastern Oregon so that these can be developed.

## San Francisco, Calif.

The importations by sea for the month of April were: 10,343 tons of Wellington; 4971 tons of Australian; 16,683 tons of Pocahontas and 4840 tons of steam coal from the state of Washington. Deliveries by rail were normal. Climatic conditions have not stimulated demand for household purposes and movement of coal has been far from brisk.

Owing to the small arrivals of Australian during the past three months, the total aggregating only 9636 tons, the stock of this grade has been considerably lowered; probably today there is not more than 10,000 tons on hand.

Prices remain unchanged, the rate to dealers being as follows per ton:

| | |
|---|---|
| Wellington (British Columbia) | $8.00 |
| Pelan Main (Australian) | 8.00 |
| Rocky Mountain | 8.50 |
| Anthracite (Pennsylvania) | 15.00 |
| Cumberland | 12.50 |

## Production and Transportation Statistics

### The Girard Estate

Anthracite coal-mining operations on the property of the Girard Estate in 1911 were conducted on the largest scale on record. Both the production and shipments of coal, from the estate exceeded those of any previous year. Total production was 2,420,747 tons and total shipments 2,162,047 tons. As compared with these figures, the total production in 1907, the heaviest previous year, was 2,306,143 tons and the total shipments 2,101,199 tons.

### The Consolidation Coal Co.

The Consolidation Coal Co. is now shipping coal at the rate of 40,000 tons per day. The business of the Consolidation has been heavy since the first of January. The shipments reported for the period from that date to May 9 totaled 3,587,257 tons as compared with 2,832,443 tons for 1911, or a gain of 754,814 tons for the current year.

### The Car Situation

The idle car statement of the American Railway Association for the two weeks ended on May 9 shows a decrease in the net surplus of 8783. The total surplus over and above the shortages reported in some sections was 130,008.

This decrease, following a sudden and large increase in the number reported in the preceding statement, is explained by the resumption of activity in the coal fields and the release of stored up fuel in view of the settlement. In the two weeks just reported for, the surplus of idle cars decreased from 94,943 to 83,512. That general business has not improved correspondingly is indicated by an increase in the box-car surplus from 19,583 to 20,626.

The following table shows the surplus and shortages of cars on 167 roads on May 9 last:

| | Surplus | Short | Net Surplus |
|---|---|---|---|
| Box | 20,626 | 3,294 | 17,332 |
| Flat | 3,261 | 1,454 | 1,807 |
| Coal, gond. and hopper. | 83,512 | 1,233 | 82,279 |
| Other kinds | 29,377 | 697 | 28,680 |
| Total | 133,776 | 6,678 | 130,098 |

### Anaconda Copper Mining Co.

The coal department of this company produced during 1911, 800,073 tons, as compared with 828,529 tons for the year previous. Company is making extensive hydro-electric installations, by which they are effecting considerable economy in their coal consumption. The Belt mine, representing about one-eighth of their total production, is scheduled to be closed June 30.

### The Island Creek Coal Co.

This company has produced during the first four months of the current year about 625,000 tons of coal, or at the rate of 1,900,000 tons for the whole year. Production during April exceeded 180,000 tons, and for May should reach about 200,000.

## Foreign Markets

### Germany

The following is a statement of the production, imports and exports in the German Empire, for the month of March, 1912, in metric tons:

| | Production | Imports | Exports |
|---|---|---|---|
| Coal | 12,811,823 | 497,457 | 2,420,993 |
| Lignite | 7,041,990 | 709,083 | 4,445 |
| Coke | 2,130,905 | 40,599 | 507,748 |
| Briquettes | 2,009,240 | 17,005 | 240,605 |

### Great Britain

Business in all branches of the steam-coal trade continues very quiet; colliery outputs remain abnormal, with the result that supplies are very plentiful and prices show a further heavy reduction:

| | |
|---|---|
| Best Welsh steam coal | $4.68 |
| Seconds | 4.50 |
| Thirds | 4.14 |
| Best dry coals | 4.62 |
| Best Monmouthshire | 4.32 |
| Seconds | 4.14 |
| Best Cardiff small coal | 2.52 |
| Seconds | 2.40 |

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those of Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days, less 2½ per cent.

### British Exports in 1911

The total coal exports from Cardiff were 16,127,777 tons. The northwestern ports exported 711,703 tons, and the northeastern ports, 21,716,027 (New Castle 6,884,611 and South Shields 5,299,752). Humber ports exported 6,264,063 tons, and other English ports 325,376. Scotland exported 10,382,311 tons and London only 2089.

Nearly half the coal exported by Great Britain brings prices ranging between $1.92 and $2.66 per ton. Of the grand total, the Bristol Channel ports exported about 40 per cent., but these ports are responsible for practically the whole of the coal exported at prices exceeding $3.12, the figures being 19,221,076 tons out of a total of 19,727,291.

## Financial Notes

The International Coal & Coke Co., capitalized at $3,000,000, paid $56,073.38 in dividends, expended $77,554.28 for maintenance and $47,029.61 for improvements and equipment at its plant during 1911.

The Island Creek Coal Co. will this year expend $500,000 for the erection of a huge dock at Grassy Point, Duluth, capable of handling 400,000 tons of coal and storing 200,000 tons. This development is to be paid for with surplus cash funds already in hand.

In the first quarter of 1911 operations of the Pittsburgh Coal Co. resulted in a considerable deficit, whereas this year the net earnings for the first three months showed a substantial surplus. An increase in the preferred dividend from 5% is in prospect.

That the Lehigh Coal & Navigation Co., which owns no railroad, is making money on mining coal, is shown by the payment of 8% dividends and by the increase of capital stock from 19,000,000 to 26,500,000; by a scrip dividend of 15% in 1910 convertible into stock and a 10% allotment of stocks at par in 1911.

The Reading Co. owns directly, through the Philadelphia & Reading Coal & Iron Co., over 40% of the anthracite deposits of Pennsylvania, and indirectly, through the Jersey Central, which holds 97% control of Lehigh & Wilkes-Barre Coal Co., 17% more. The Reading Coal & Iron Co. produces roughly 10,000,000 tons and the Lehigh and Wilkes-Barre 5,500,000 tons of anthracite per annum out of the total of 65,000,000.

Chairman Taylor, of the Pittsburgh Coal Co., states that the pension-fund plan becomes effective Apr. 1 next. The pension fund on Dec. 31 amounted to $92,329. The year's receipts of the relief fund, including a balance of $45,[illegible] on Jan. 1, 1911, were $161,842, the company appropriating $32,129. After the 1911 disbursements had been made there remained a balance of $42,886. Since the fund was established, receipts have amounted to $1,068,386, and disbursements to $1,025,500.

In the five years 1907 to 1911 inclusive, the Philadelphia & Reading Coal & Iron Co. paid out for rail transportation a total of $40,283,313. Undoubtedly the major part of it went to the Reading Ry., but not all. Granting that it did, however, and assuming that the railway's expense ratio on moving the hard coal from the Coal & Iron Co.'s collieries is 50% (ratio of all expenses in 1911 was 60.6%) the railway received for its net $20,141,000 on coal carried for the controlled property during the five years. Deducting from this railway net the $9,900,000 said to have been lost on the operation of the collieries, a little over $10,200,000 is left to represent the profit of Reading coal mines to it